



# Governor's Budget State of Montana Fiscal Years 1998-1999

Marc Racicot  
Governor

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**RECLAMATION AND DEVELOPMENT GRANTS PROGRAM  
REPORT TO THE LEGISLATURE**

**Projects Proposed for the 1999 Biennium  
and  
Status Report of 1987-1995 Projects**

**January 1997**

**Montana Department of Natural Resources and Conservation  
Conservation and Resource Development Division  
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## ABBREVIATIONS

|              |  |
|--------------|--|
| AMRB         | Abandoned Mine Reclamation Bureau, Montana Department of Environmental Quality   |
| ARCO         | Atlantic Richfield Company   |
| BMP          | best management practice   |
| BOGC         | Montana Board of Oil and Gas Conservation  |
| CD           | conservation district  |
| DEQ          | Montana Department of Environmental Quality  |
| DFWP         | Montana Department of Fish, Wildlife and Parks   |
| DHES         | Montana Department of Health and Environmental Sciences (now Montana Department of Environmental Quality)  |
| DNRC         | Montana Department of Natural Resources and Conservation   |
| DSL          | Montana Department of State Lands (now divided between the Montana Department of Natural Resources and Conservation and the Montana Department of Environmental Quality) |
| EPA          | U.S. Environmental Protection Agency   |
| FY           | fiscal year  |
| GIS          | geospatial information system  |
| GWIC         | Groundwater Information Center, Montana Bureau of Mines and Geology  |
| MBMG         | Montana Bureau of Mines and Geology  |
| MCA          | <i>Montana Code Annotated</i>  |
| MHCH         | Mile High Conservation District  |
| Montana Tech | Montana Tech of The University of Montana  |
| MSCA         | Montana Salinity Control Association   |
| MSU          | Montana State University   |
| NPS          | nonpoint source  |
| NRCS         | Natural Resource Conservation Service, U.S. Department of Agriculture  |
| PCCD         | Petroleum County Conservation District   |
| SEM          | scanning electron microscope   |
| RC&D         | Resource Conservation and Development Area   |
| RDGP         | Reclamation and Development Grants Program   |
| RIT          | Resource Indemnity Tax   |
| TLMD         | Trust Land Management Division, Montana Department of Natural Resources and Conservation   |
| USDA         | U.S. Department of Agriculture   |
| USFS         | Forest Service, U.S. Department of Agriculture   |
| WQA          | Water Quality Act  |





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This appendix is available upon request from the Department of Natural Resources  
and Conservation, Conservation and Resource Development Division





**INDEX OF PROJECTS SUBMITTED FOR FUNDING IN THE**  
**1999 BIENNIUM**

Following is a list of projects submitted for funding in the 1999 biennium. For easy reference, the list is alphabetized by the names of the project sponsors. However, in Chapter II the project summaries and recommendations are presented in the order of their ranking by the Department of Natural Resources and Conservation and the Governor.

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## CHAPTER I

### PROGRAM DESCRIPTION AND PROCEDURES

#### Program Information

The Reclamation and Development Grants Program (RDGP) is a state-funded grant program designed to fund projects that *"indemnify the people of the state for the effects of mineral development on public resources and that meet other crucial state needs serving the public interest and the total environment of the citizens of Montana"* (Section 90-2-1102, MCA). The program, established by the 1987 Montana Legislature, is administered by the Montana Department of Natural Resources and Conservation (DNRC).

In February 1996, DNRC mailed application materials to all Montana communities, counties, the university system, conservation districts, state agencies, state legislators, and others who might benefit by program participation. The application deadline was May 15, 1996. DNRC received 30 applications for RDGP funding totaling over \$6.8 million.

The funding source for this program is the interest income from the resource indemnity tax (RIT) trust fund. This fund, established by Section 15-38-201, MCA, receives proceeds from taxes levied on mineral production. During state fiscal years 1986 through 1997, 120 projects totaling more than \$21 million have been authorized for funding by previous legislatures. The 1993 legislature directed that, beginning in state fiscal year 1996, a minimum of \$3 million be allocated for grants. In 1993, the legislature also directed DNRC to give priority to grant requests from the Montana Board of Oil and Gas Conservation (BOGC). This priority is not to exceed \$600,000 for the biennium and does not preclude BOGC from submitting additional grant requests. Additional BOGC grant requests are received and ranked by DNRC in the same manner as all other grant requests submitted.

The Reclamation and Development Grants Program Act requires that the Governor submit, by the first day of each regular session of the legislature, a list of all grant proposals received with his or her recommended priorities for funding. Administrative rules further provide that DNRC must furnish to the legislature a status report on previously funded projects, which is here provided in Chapter III and Table 2. This report is the result of those directives.

#### Project Eligibility

The following excerpt from the Reclamation and Development Grants Program Act (Section 90-2-1112, MCA) establishes criteria that projects must meet in order to be eligible for funding.

1. *Except as provided under subsection (2), to be eligible for funding under the Reclamation and Development Grants Program, the proposed project must provide benefits in one or more of the following categories:*
  - a. *Reclamation of land, water, or other resources adversely affected by mineral development*
  - b. *Mitigation of damage to public resources caused by mineral development*
  - c. *Research, demonstration, or technical assistance to promote the wise use of Montana minerals, including efforts to make processing more environmentally compatible*
  - d. *Investigation and remediation of sites where hazardous wastes or regulated substances threaten public health or the environment, and*





- e. *Research to assess existing or potential environmental damage resulting from mineral development.*
2. *If sufficient eligible and qualified applications satisfying the mineral development objectives provided for in subsection (1) are not received or if there is a crucial state need, the department [DNRC] may evaluate and the Governor may recommend that the legislature approve funding for projects that:*
  - a. *Enhance Montana's economy through the development of natural resources, or*
  - b. *Develop, promote, protect, or further Montana's total environment and public interest, including the general health, safety, welfare, and public resources of Montana citizens and communities.*

### Applicant Eligibility

Any department, agency, board, commission, or other division of state government or any city, county, or other political subdivision or tribal government within the state may apply for a grant from the Reclamation and Development Grants Program.

### Funding Limits

No grant may exceed \$300,000. An applicant proposing more than one project may submit a separate application for each. There is no minimum funding limit.

### Application Review And Ranking Procedures

The grant applications were evaluated for the proposed projects' technical and financial feasibility, public benefits to be provided, need and urgency, and impacts on the environment. Reviewers included staff members of the department's Conservation and Resource Development Division, with assistance from federal, state, and university personnel having expertise in specific project areas. For each application, a descriptive project assessment was written incorporating the concerns, ideas, and comments of the project reviewers; those assessments appear in the appendix to this report, which is published as a separate volume. A less detailed description of each proposed project can be found in Chapter II.

More funds are requested than are available. Therefore, the department ranks feasible projects, so that it can recommend funding priority and funding level to the Governor and the legislature. Evaluation criteria established by the 1987 legislature include, but are not limited to:

1. The degree to which the project will provide benefits in its eligibility category or categories
2. The degree to which the project will provide public benefits
3. The degree to which the project will promote, enhance, or advance the policies and purposes of the Reclamation and Development Grants Program
4. The degree to which the project will provide for the conservation of natural resources
5. The degree of need and urgency for the project
6. The extent to which the project sponsor or local entity is contributing to the costs of the project or is generating additional nonstate funds



7. The degree to which jobs are created for persons who need job training, receive public assistance, or are chronically unemployed
8. Any other criteria DNRC considers necessary to carry out the policies and purposes of the Reclamation and Development Grants Program

Under the ranking system, a proposal could receive a maximum of 215 points. Specific criteria were established for each category to provide consistency. Of the following criteria, public benefits and need and urgency were weighted most heavily.

|  | <u>Maximum Points</u><br><u>Possible</u> |
|--|--|
| 1. Public Benefits                     | 90                                       |
| 2. Need and Urgency                    | 50                                       |
| 3. Appropriateness of Technical Design | 40                                       |
| 4. Financial Feasibility               | 15                                       |
| 5. Project Management Organization     | <u>20</u>                                |
| Total Possible Points:                 | 215                                      |

### Recommendations

After ranking the projects and recommending funding, the Conservation and Resource Development Division made its recommendations to the DNRC director. The director then presented DNRC's recommendations to the Governor. The final ranking of the proposed projects is presented in Table 1, along with funding recommendations. The locations of the 17 projects recommended for funding are shown in Figure 1.

An appropriations bill listing the Governor's recommendations will be introduced to the 1997 legislature. By appropriation or other appropriate means, the legislature may approve grants for those projects it finds consistent with the policies and purposes of RDGP.



TABLE 1

## RANKING AND FUNDING RECOMMENDATIONS

| Rank | Project Sponsor<br>(Project Title)   | Amount<br>Requested | Amount<br>Recommended | Cumulative<br>Total<br>Recommended |
|------|--|---------------------|-----------------------|------------------------------------|
|      | * Montana Board of Oil and Gas Conservation<br>(Balco Disposal Facility, Plug and Abandonment and<br>Site Restoration) | \$300,000           | \$600,000             | \$600,000                          |
| 1    | Montana Department of Natural Resources and Conservation<br>(Reliance Refinery Soils and Sludge Cleanup #1)            | 300,000             | 300,000               | 900,000                            |
| 2    | Montana Department of Natural Resources and Conservation<br>(Reliance Refinery Soils and Sludge Cleanup #2)            | 282,300             | 282,300               | 1,182,300                          |
| 3    | Montana Department of Environmental Quality-Abandoned<br>(Nancy Lee Mine Complex Reclamation)                          | 286,914             | 286,914               | 1,469,214                          |
| 4    | Montana Department of Environmental Quality-Abandoned<br>(Nellie Grant Mine Reclamation Project)                       | 288,040             | 288,040               | 1,757,254                          |
| 5    | Powell County<br>(Charter Oak Mine and Mill Reclamation)   | 248,000             | 300,000               | 2,057,254                          |
| 6    | Mile High Conservation District<br>(Highland Mill Reclamation)   | 293,992             | 258,070               | 2,315,324                          |
| 7    | Butte-Silver Bow Local Government<br>(Upper Clark Fork Basin: Superfund Technical Assistance)                          | 99,832              | 91,532                | 2,406,856                          |
| 8    | Montana Board of Oil and Gas Conservation<br>(1996 "A" Orphaned Well Plug and Abandonment and<br>Site Restoration)     | 300,000             | 164,222               | 2,571,078                          |
| 9    | Carbon County<br>(Dry Hydrant Demonstration Project)   | 157,579             | 157,579               | 2,728,657                          |
| 10   | Toole County<br>(North Toole County Reclamation Project)   | 296,202             | 40,000                | 2,768,657                          |
| 11   | Montana Board of Oil and Gas Conservation<br>(1996 "B" Orphaned Well Plug and Abandonment and<br>Site Restoration)     | 300,000             | 190,000               | 2,958,657                          |
| 12   | Montana State University - Reclamation<br>(Reclaimed Metal Mine Lands: Agricultural Uses<br>and Restrictions)          | 129,114             | 129,114               | 3,087,771                          |
| 13   | Montana Bureau of Mines and Geology<br>(Training for Environmentally and Economically Sound<br>Resource Development)   | 76,043              | 49,722                | 3,137,493                          |
| 14   | Walkerville, Town of<br>(Walkerville's Plan for Development of Reclaimed Mine<br>Properties)                           | 113,600             | 40,700                | 3,178,193                          |
| 15   | Butte-Silver Bow Local Government<br>(Travona Mineyard Preservation and Enhancement)                                   | 170,280             | 145,280               | 3,323,473                          |
| 16   | Yellowstone Conservation District<br>(Watershed Planning in Montana Integrating<br>Geospatial Information)             | 300,000             | 100,000               | 3,423,473                          |
|      | Butte-Silver Bow Local Government<br>(Butte Mine Subsidence Reclamation Project)                                       | 300,000             | 0                     | 3,423,473                          |
|      | Deer Lodge Valley Conservation District<br>(Development of Acid/Heavy Metal Tolerant Cultivars)                        | 100,000             | 0                     | 3,423,473                          |





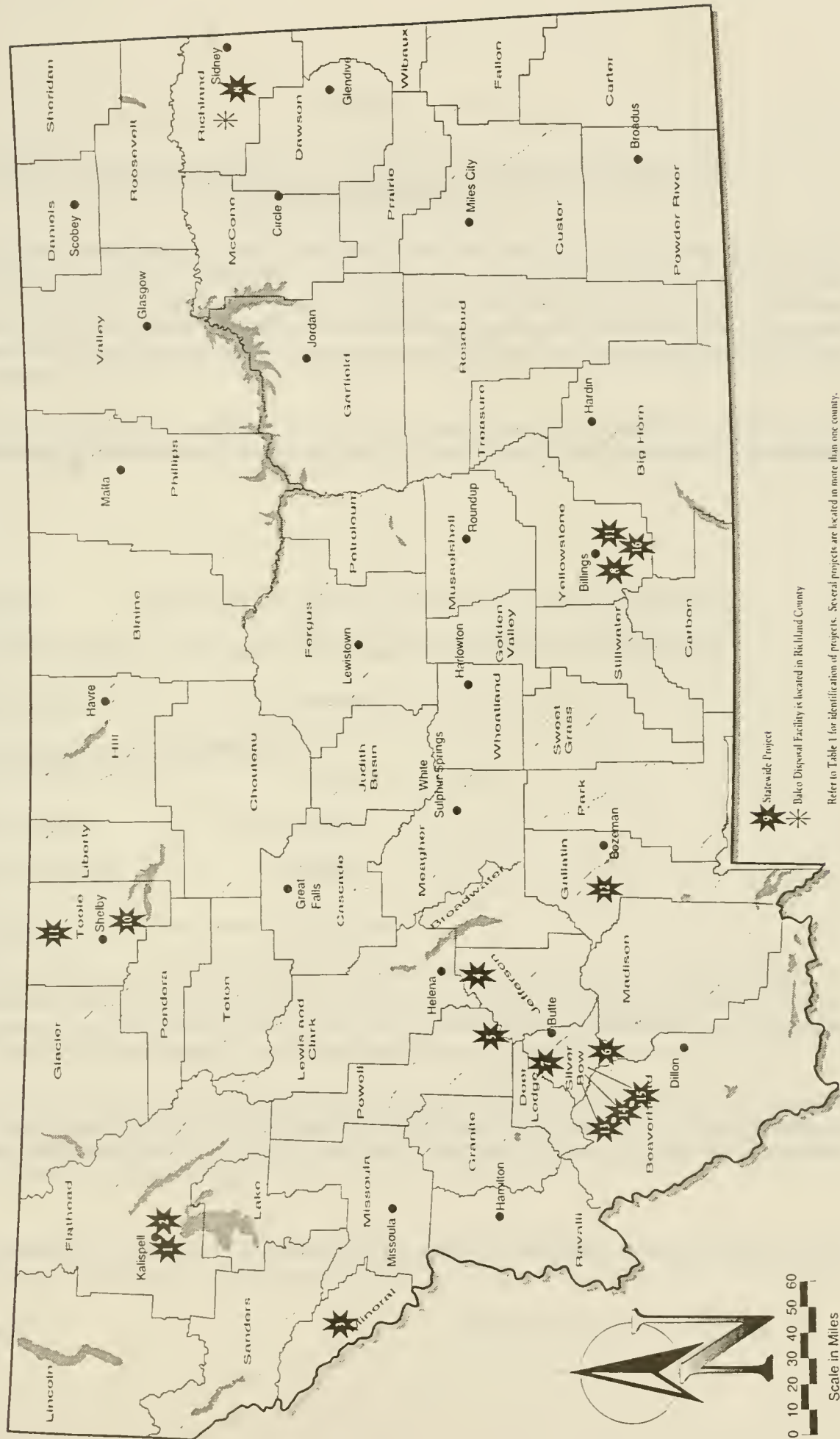
|   |                    |   |           |
|---|--------------------|---|-----------|
| Lewis and Clark County Water Quality Protection District<br>(Tenmile Mine Site Reclamation Project, Phase II)               | 268,121            | 0 | 3,423,473 |
| Missoula, City of<br>(Glacial Lake Missoula: An Untapped Natural<br>Resource Opportunity)                                   | 166,089            | 0 | 3,423,473 |
| Montana Board of Oil and Gas Conservation<br>(1996 "C" Orphaned Well Plug and Abandonment and<br>Site Restoration)          | 300,000            | 0 | 3,423,473 |
| Montana Bureau of Mines and Geology<br>(Oil and Gas Potential along the Fromberg Fault Zone,<br>South-Central Montana)      | 95,139             | 0 | 3,423,473 |
| Montana Department of Environmental Quality<br>(Nonpoint Source Pollution Control in Montana)                               | 300,000            | 0 | 3,423,473 |
| Montana State University - Extension<br>(Montana Local Government Pollution Prevention<br>Assistance Project)               | 284,292            | 0 | 3,423,473 |
| Montana State University - Reclamation<br>(Reclamation of Acid-Producing Mining Wastes Utilizing<br>Industrial By-Products) | 297,289            | 0 | 3,423,473 |
| North Powell Conservation District<br>(A Watershed Approach for Mine Waste Cleanup in the<br>Blackfoot Basin, Montana)      | 180,000            | 0 | 3,423,473 |
| Rosebud Conservation District<br>(Hydrologic and Geologic Feasibility of Coal-Mine Pits<br>as Water Impoundments)           | 282,443            | 0 | 3,423,473 |
| University of Montana<br>(Gold Resource and Groundwater Contamination of the<br>Judith Mountains: An Evaluation Plan)       | 39,799             | 0 | 3,423,473 |
| Yellowstone County<br>(South Billings Boulevard Gravel Pit Reclamation)   | <u>300,000</u>     | 0 | 3,423,473 |
| <b>TOTAL REQUESTS</b>   | <b>\$6,855,068</b> |   |           |

The minimum funding for RDGP is \$3,000,000.

\*The Montana Board of Oil and Gas Conservation has statutory priority for \$600,000 in grant funds.



Figure 1. Reclamation and Development Grants Program  
Location of Projects Recommended for Funding





## CHAPTER II

### PROJECT FUNDING INFORMATION, ABSTRACT, AND RECOMMENDATIONS FOR THE 1999 BIENNium

Abstracts of all projects submitted for RDGP funding, along with the amounts recommended, are presented in this chapter. The abstracts summaries were prepared by the applicants. The department's technical analysis of each project is provided in the appendix to this report. The summaries of projects recommended for funding appear in the order in which those projects are ranked. Total project cost has been adjusted to reflect the recommended funding amount. Not all proposals are recommended for funding; the summaries of those projects are alphabetized by the name of the applicant and presented at the end of this chapter.

The Board of Oil and Gas Conservation has statutory priority over all applications submitted in the amount of \$600,000. This amount has been recommended for the Balco Disposal Facility, which appears first in the abstracts of recommended projects.

APPLICANT NAME: MONTANA BOARD OF OIL AND GAS CONSERVATION (BOGC)

PROJECT/ACTIVITY NAME: Balco Disposal Facility, Plug and Abandonment and Site Restoration

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING AMOUNTS AND SOURCES:

\$ 10,000 Applicant

TOTAL PROJECT COST:<sup>1</sup> \$ 610,000

RECOMMENDED FUNDING: \$ 600,000

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The purpose of this grant request is to provide funding to remediate the Balco Disposal Facility. The site contains +/-50,000 barrels of oil sludge and an old saltwater pit. It is unknown how much contamination has occurred under the pit. Cost estimates range from \$500,000 to \$1 million. If any funds are available after the Balco site restoration project is complete, the funds will be used to properly plug and abandon additional orphaned oil and gas wells.

The Board of Oil and Gas Conservation will eliminate the threat of further contamination by soliciting bids to remediate the site and plug and abandon the well. Under the supervision of the Board of Oil and Gas Conservation's staff, the successful bidder will dispose of the oil sludge, properly plug and abandon the well, dispose of and/or remediate contaminants, and reclaim the surface location.

<sup>1</sup>For projects recommended for funding, TOTAL PROJECT COST is the sum of OTHER FUNDING AMOUNTS AND SOURCES plus the RECOMMENDED FUNDING amount.





The disposal facility was used extensively until 1992, when the operator's bond was forfeited, and the operator was instructed to reclaim the location and plug the well. Since that time severe penalties have been imposed on the operator by the U.S. Environmental Protection Agency. The operator is unable to operate the facility and will not reclaim the facility. The company's assets will not cover the liabilities to creditors, leaving the operator insolvent. Since the operator is unwilling and most likely unable to perform the site restoration, the responsibility for the disposal facility and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State. The sludge will be disposed of properly, the well will be properly plugged and abandoned, and the location will be reclaimed when funding is made available. Once grant and Oil and Gas Damage Mitigation Account money is spent on the Balco Disposal Facility, liens will be filed in accordance with Section 82-11-201, MCA.

The orphaned wells are located throughout Montana. In most cases the wells that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.

PROJECT NO. 1 (The following project summary includes two applications.)

APPLICANT NAME: MONTANA DEPARTMENT OF NATURAL RESOURCES AND  
CONSERVATION - TRUST LAND MANAGEMENT DIVISION (TLMD)

PROJECT/ACTIVITY NAME: Reliance Refinery Soils and Sludge Cleanup #1  
Reliance Refinery Soils and Sludge Cleanup #2

AMOUNT REQUESTED: \$ 582,300

OTHER FUNDING AMOUNTS AND SOURCES:

\$ 50,000 Applicant  
\$ 100,000 Montana Department of Environmental Quality (DEQ)

**TOTAL PROJECT COST:** \$ 732,300

RECOMMENDED FUNDING: \$ 582,300

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The Trust Land Management Division (School Trust Lands) is applying for two concurrent Reclamation and Development Grants to clean up petroleum-contaminated soils and sludges resulting from operations at the former Reliance Refinery in Kalispell, Montana. The proposed cleanup plan is to treat contaminated soils in an asphalt batch plant with the end product used for road construction. The ultimate goal is to restore the site to usable land so the State can again lease this property.

The Reliance Refinery Company owned and operated a crude oil refinery near the city of Kalispell from approximately 1925 to 1930. Refinery operations apparently were not economically feasible because School Trust Lands obtained title





to the property under a foreclosure of lien for delinquent oil taxes in September 1934. Unity Petroleum Corporation subsequently leased the property from the State and operated the refinery from 1935 to 1971. Waste oils, sludges, and tar substances were disposed of in pits and/or discharged onto the ground surface while the refinery was operational. These petroleum constituents have contaminated the soil and groundwater on and beneath the site and represent a hazard to the community, as well as the environment. The majority of the contamination is located on approximately a 5-acre parcel that is within 150 feet of a number of private residences and about 750 feet from the Stillwater River.

The proposed remedial method will be to remove, treat, and recycle approximately 20,000 cubic yards of petroleum-contaminated soils into road-grade asphalt. The contaminated overburden will be crushed and incorporated into the feed stream at a local asphalt batch plant, thereby converting this liability into a usable end product. The primary objective is to eliminate the risk of human physical contact with and exposure to the contaminants. The site is contained on the state Superfund list and has been ranked as a high priority by the Montana Department of Environmental Quality.

The project has broad-based local and state support. The Honorable Douglas D. Rauthe, Mayor of Kalispell, aptly summarized the importance of this project: "Once cleaned up, this property can be put to a useful purpose." Research of all potentially responsible parties has determined that no viable party exists that could be held responsible for contamination and cleanup of the site. No federal moneys are available to address remediation of this property.

PROJECT NO. 2

APPLICANT NAME: MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION - TRUST LAND MANAGEMENT DIVISION (TLMD)

PROJECT/ACTIVITY NAME: Reliance Refinery Soils and Sludge Cleanup #2

Please refer to the project writeup on page 8 of this report.



**PROJECT NO. 3**

**APPLICANT NAME:** MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY - ABANDONED  
MINE RECLAMATION BUREAU (DEQ/AMRB)

**PROJECT/ACTIVITY NAME:** Nancy Lee Mine Complex Reclamation

**AMOUNT REQUESTED:** \$ 286,914

**OTHER FUNDING AMOUNTS AND SOURCES:**

|              |   |
|--------------|---|
| \$ 3,200,000 | Applicant   |
| \$ 19,000    | U.S. Department of Agriculture (USDA)<br>Lolo National Forest |

**TOTAL PROJECT COST:** \$ 3,505,914

**RECOMMENDED FUNDING:** \$ 286,914

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purpose of this project is to address human health and safety hazards from exposure to heavy metals. The project encompasses three sites: the Nancy Lee Mines, the Nancy Lee Mill site and the Nancy Lee-Slowey Mill site. These sites are a result of over a century of mining and milling activities, that have deposited tailings and waste rock contaminated with high levels of arsenic, lead, and manganese. In combination, the sites have approximately 140,000 cubic yards of tailings and 30,000 cubic yards of waste rock that have contaminated soil and water and destroyed vegetation. In addition, easy access to these sites allows motorbikers, hunters, and nearby residents to become exposed to the contamination. Also, contaminated groundwater appears to be migrating into the Clark Fork River from the Slowey Mill tailings, only 200 feet away.

The primary goals of this project are to reclaim the sites and reduce the exposure of the public and the surrounding environment to the hazards. The goals can be achieved by consolidating, capping, and revegetating wastes on the sites.

The Montana Department of Environmental Quality, Abandoned Mine Reclamation Bureau will be the organization responsible for conducting this reclamation project.

The Nancy Lee-Slowey Mill site is located on private land adjacent to the Clark Fork River in Section 14, Township 17 North, Range 27 West. The Nancy Lee Mines and the Nancy Lee Mill site are located on U.S. Forest Service land and private land in Section 31, Township 18 North, Range 26 West, and Sections, 5 and 6, Township 17, North, Range 26 West, in Mineral County, Montana. The sites are accessed from Superior by traveling 4 miles northwest on I-90 to Exit 43 and then driving 3 miles northwest on the frontage road to the Slowey Mill or driving 1 mile to Keystone Gulch Road, then 4 miles to the Nancy Lee Mine and Mill.

Project construction should be completed within 60 consecutive calendar days.



**PROJECT NO. 4**

**APPLICANT NAME:** MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY - ABANDONED MINE RECLAMATION BUREAU (DEQ/AMRB)

**PROJECT/ACTIVITY NAME:** Nellie Grant Mine Reclamation Project

**AMOUNT REQUESTED:** \$ 288,040

**OTHER FUNDING AMOUNTS AND SOURCES:**  
\$1,200,000 Applicant

**TOTAL PROJECT COST:** \$1,488,040

**RECOMMENDED FUNDING:** \$ 288,040

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purpose of this project is to address human health and safety hazards associated with exposed and accessible, heavy-metals-contaminated soil, waste rock, and tailings at the Nellie Grant Mine site. As a result of over 100 years of mining, the Nellie Grant Mine site harbors an estimated 7,000 cubic yards of surface mill tailings; 6,000 cubic yards of buried tailings; and 26,000 cubic yards of waste rock. All of these mine waste materials contain significantly elevated levels of arsenic, cadmium, copper, mercury, lead, and zinc. Site surface water and groundwater degradation has been documented. Surface water enters the site with a relatively low heavy-metals content and a pH of 6.5. This same water, after coming in contact with mine waste, exits the site enriched with a significant amount of heavy metals and a pH of 3.7. Site water sampling clearly indicates contaminant migration off-site. Contaminated soil and water have affected site trees, grass, and shrubs, which have all succumbed to heavy metal poisoning. As a result, much of the site is devoid of any kind of vegetation.

The primary objectives of this project are to remove solid media contaminant sources at the Nellie Grant site that exhibit hazardous waste characteristics and dispose of these wastes in a constructed repository. Site surface water would be isolated from contact with contaminated mine wastes, and all mine disturbed areas would be regraded, top soiled, and revegetated. When the above tasks are completed, heavy metals exposure and migration will be significantly reduced or eliminated. Water quality will be improved, and the site will again be able to support a stand of native vegetation species.

The Montana Department of Environmental Quality, Abandoned Mine Reclamation Bureau will be the organization responsible for conducting this reclamation project.

The Nellie Grant Mine is located approximately 13 miles southwest of Helena. The site is located in Section 14, Township 8 North, Range 5 West, Jefferson County, Montana.

Project construction should be completed within 60 consecutive calendar days.





PROJECT NO. 5

APPLICANT NAME: POWELL COUNTY

PROJECT/ACTIVITY NAME: Charter Oak Mine and Mill Reclamation

AMOUNT REQUESTED: \$ 248,000

OTHER FUNDING AMOUNTS AND SOURCES:

|            |   |
|------------|---|
| \$ 300     | Applicant                                 |
| \$ 67,250  | Helena National Forest                    |
| \$ 150,000 | Department of Environmental Quality (DEQ) |

TOTAL PROJECT COST: \$ 517,550

RECOMMENDED FUNDING: \$ 300,000

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The Charter Oak Mine and Mill are located approximately 25 miles southwest of Helena, Montana, in the SW¼, NE¼, of Section 36 Township 9 North, Range 7 West. The historical mine and mill operations at the Charter Oak site have significantly degraded the environmental setting. Based on scientific studies, data suggest that the site may pose a threat to human health and safety, and, more likely, to sensitive ecosystems of the adjoining wetlands and the Little Blackfoot River.

The fact that the site is adjacent to the Little Blackfoot River and floodplain provides the need and urgency for reclamation. Both permanent and seasonal residences are located upstream and downstream from the site along the Little Blackfoot River and floodplain. A seasonally used children's camp is located approximately one mile downstream. Genetically pure Westslope cutthroat trout have been observed in Telegraph Creek (a tributary of the Little Blackfoot River) and downstream of the site in Elliston Creek. Although uncommon, bull trout have been collected from the river near Elliston. The U.S. Forest Service has designated the Little Blackfoot River as a priority watershed for bull trout in the agency's INFISH management direction strategy.

Numerous studies and analyses have been conducted at the site to detect environmental impacts and risks to soils, sediments, tailings, and subsoils, as well as plant and animal life. Studies have concluded that heavy metals such as the contaminated mill tailings at Charter Oak represent a significant long-term risk to the aquatic resources of the Little Blackfoot River, as well as a concern to public health and safety. Removal and stabilization of the tailings and waste rock would significantly reduce the risks posed by these conditions.

In 1996, the Helena National Forest contracted an Engineering Evaluation and Cost Analysis (EECA), to analyze Phase I of the Charter Oak mine and mill reclamation project. The EECA addressed several remedial actions to deal with the tailings impoundment containing approximately 12,000 cubic yards of milling and contaminated soils tailings at the site of the former Charter Oak Mine and Mill. In July 1996, the U.S. Forest Service contracted to have Phase I completed by October 1996. The total cost of Phase I is approximately \$600,000.

This specific project being proposed for 1997 RDGP grant funding is actually Phase II of a multi-phase reclamation project already in progress. The overall reclamation goal of Phase II will be to eliminate potential environmental and



public health risks posed by the instability of and the high concentrations of metals in the waste rock dumps. Specific objectives include: prevent humans, wildlife, and aquatic life that use the area from being exposed to the high concentrations of metals; prevent contaminated waste rock from affecting the adjacent wetland area or from migrating into adjacent surfacewater and groundwater; avoid unintended environmental consequences during or after the removal and stabilization actions; and comply with Applicable or Relevant and Appropriate Requirements to the extent practical.

Phase II will begin in July 1997 and will be completed within three months. Subsequent phases will include eliminating adit discharge, closing hazardous mine openings, securing the historic integrity of the mill and other associated buildings, and monitoring water quality.

Although the Helena National Forest is the responsible organization for this site, a variety of agencies have been involved in efforts to address environmental risks in the past several years. These agencies include: the Montana Department of Environmental Quality (formerly the Department of Health and Environmental Sciences, Water Quality Bureau); the U.S. Forest Service, and the former Montana Department of State Lands (DSL), Abandoned Mine Reclamation Bureau (AMRB). The Charter Oak mine site is ranked 11th out of 276 priority mine sites in Montana, in need of priority attention (DSL, AMRB, *Abandoned Hardrock Mine Priority Sites*, 1995).

**PROJECT NO. 6**

APPLICANT NAME: MILE HIGH CONSERVATION DISTRICT

PROJECT/ACTIVITY NAME: Highland Mill Reclamation

AMOUNT REQUESTED: \$ 293,992

OTHER FUNDING AMOUNTS AND SOURCES:

|            |  |
|------------|--|
| \$ 2,592   | Applicant                                  |
| \$ 39,000  | USDA Forest Service                        |
| \$ 142,000 | Mine Waste Technology Center-MSE           |
| \$ 17,000  | Research Center-Montana State University   |
| \$ 1,422   | USDA Natural Resource Conservation Service |

TOTAL PROJECT COST: \$ 460,084

RECOMMENDED FUNDING: \$ 258,070

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

An environmental problem exists at the historical Highland Mill site located approximately 11 miles south of Butte in the upper portion of the Middle Fork of the Moose Creek drainage, on land administered by the U.S. Forest Service (SW¼ of the SE¼ of the SE¼ of Section 36, Township 1 North, Range 8 West).

The problem stems from mill tailings that were deposited in a draw during the operation of the mill from 1937 until 1942. The tailings contain high concentrations of arsenic and copper that are slowly eroding and degrading range, watershed,



and wildlife resources. In addition, the potential exists for significant movement of the tailings if a major storm event or rapid snowmelt occurs.

It is the intent of the Mile High Conservation District (MHCD), in cooperation with the U.S. Forest Service (USFS), the Mine Waste Technology Center, and the Reclamation Center at Montana State University (MSU), to reclaim the site and return it to a natural and productive state. MHCD is responsible for the project but will enter into a Letter of Agreement with USFS to implement and oversee the project.

The goal of the project is to remove the tailings from the draw to a nearby area that is less prone to erosion, where they will be contained and possibly neutralized. The project will reestablish the natural flow of water in the draw and the associated riparian habitat.

In the summer of 1996, all parties began working at the site to validate the final project plan. Bidding for developing the containment area and removing the tailings from the draw would occur in late June 1997. Actual reclamation activity at the site would start in July 1997 and be completed within three months. The project would be completed in October 1997.

## PROJECT NO. 7

APPLICANT NAME: BUTTE-SILVER BOW LOCAL GOVERNMENT

PROJECT/ACTIVITY NAME: Upper Clark Fork Basin: Superfund Technical Assistance

AMOUNT REQUESTED: \$ 99,832

OTHER FUNDING AMOUNTS AND SOURCES:

\$ 136,927 Applicant

TOTAL PROJECT COST: \$ 228,459

RECOMMENDED FUNDING: \$ 91,532

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The principal purpose of this project is to sustain the efforts of Butte-Silver Bow, Anaconda-Deer Lodge, Powell, and Granite Counties and other local governments in the upper Clark Fork River basin to coordinate and manage Superfund activities. The project allows local governments and citizens (who possess limited financial and technical resources) to hire an individual with the independent analytical capabilities to evaluate scientific reports, remedial designs, and long-term plans. Information communicated to local leaders and citizens will enable them to participate in the Superfund decision-making process effectively.

The Superfund process in the upper Clark Fork River basin is ongoing and will by no means be complete by 1997. In fact, major decisions related to the remediation of many of the area's most serious environmental problems, such as the Butte priority soils and streamside tailings along the entire stretch of the upper Clark Fork, will finally be under full consideration in the 1997-1999 time period. Consequently, the services and technical assistance provided through this grant will continue to be vital.





The State of Montana's support and commitment to help these four counties, as demonstrated through this grant program, are critical. The counties are struggling to attain a meaningful role in the decision-making process. The upper Clark Fork River basin is a prime resource, and the eventual cleanup, reclamation, and/or mitigation of the mineral development impacts that occurred in the area over the past 116 years are a great challenge for all of Montana. Also, natural resource damage claim litigation is ongoing between the State of Montana and ARCO.

The cleanup of this river basin will have a tremendous positive impact on the region within and surrounding the basin, and it is likely that the decisions made will set strong precedents for cleanup activities elsewhere in the state and nation.

**PROJECT NO. 8**

**APPLICANT NAME:** MONTANA BOARD OF OIL AND GAS CONSERVATION

**PROJECT/ACTIVITY NAME:** 1996 "A" Orphaned Well Plug and Abandonment and Site Restoration

**AMOUNT REQUESTED:** \$ 300,000

**OTHER FUNDING AMOUNTS AND SOURCES:**  
\$ 10,000 Applicant

**TOTAL PROJECT COST:** \$ 174,222

**RECOMMENDED FUNDING:** \$ 164,222

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The purposes of this grant request are to provide funding to plug and abandon orphaned oil and gas wells properly, and to perform the surface reclamation. The wells are uneconomic and have the potential to cause damage to subsurface formations, the state's water, and the surface around each well.

The Board of Oil and Gas Conservation will eliminate the threat of contamination by soliciting bids to plug and abandon the wells. Under the supervision of the board's staff, the successful bidder will properly plug and abandon each well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells produced oil and/or gas in the past. The operators could no longer afford to produce the wells, and the wells were shut in. The companies' assets will not cover the liabilities to creditors, leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State. The wells will be properly plugged and abandoned when funding is made available.

The orphaned wells are located throughout Montana. In most cases the wells that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.





**PROJECT NO. 9**

**APPLICANT NAME:** CARBON COUNTY

**PROJECT/ACTIVITY NAME:** Dry Hydrant Demonstration Project

**AMOUNT REQUESTED:** \$ 157,579

**OTHER FUNDING AMOUNTS AND SOURCES:**

|            |  |
|------------|--|
| \$ 32,848  | U.S. Natural Resource Conservation Service |
| \$ 210,000 | Local fire departments                     |

**TOTAL PROJECT COST:** \$ 400,427

**RECOMMENDED FUNDING:** \$ 157,579

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Water is the single most valuable resource a firefighter can utilize in fire suppression. Readily accessible sources of water are a must for rural departments in providing protection to the vast area of the state. All too often, rural firefighters lose the battle of time while accessing water. Dry hydrants, which are permanent suction lines installed in a pond or stream, can provide a faster, more efficient source of water for these emergency efforts.

Major fire incidents over the past decade have drawn attention to the importance of rural fire protection. The million-dollar Hawk Creek Fire in Mussellshell County in 1984, the firestorm that swept Blaine County in 1991, and the seemingly endless summer of 1994 in Lincoln County have provided a wake-up call for Montana residents. Volunteer fire companies diligently respond to our calls, but are often handicapped by the lack of resources to do the job. Strategic, dependable access to water is the most commonly cited need of rural fire departments.

This demonstration will introduce the concept of dry hydrants to Montana residents through a statewide project. Beginning in the spring of 1997, departments will install 280 hydrant sites in critical locations. All Montana residents will be informed of the project through a statewide media campaign. Data from hydrant use in the first year will be collected and a cost/benefit analysis compiled to show the effectiveness of the new system. The project is scheduled for completion by December 1998.

This proposal seeks \$157,579 in funding to obtain the necessary hardware to install these sites. The cooperative effort of rural departments, local governments, and private landowners will be utilized to implement this project. The project will be coordinated by the Beartooth RC&D Area with the assistance of the other RC&D programs.



PROJECT NO. 10

APPLICANT NAME: TOOLE COUNTY

PROJECT/ACTIVITY NAME: North Toole County Reclamation Project

AMOUNT REQUESTED: \$ 296,202

OTHER FUNDING AMOUNTS AND SOURCES:  
\$ 31,988 Applicant

TOTAL PROJECT COST: \$ 71,988

RECOMMENDED FUNDING: \$ 40,000

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Oil development and production, in the north-central Toole County Kevin-Sunburst field, started in 1922. The field is located approximately 15 miles north of Shelby along Interstate 15 and surrounding Kevin on the Oilmont Highway. When regulation became effective in 1954, several thousand wells were already in place. The development area encompassed over 13,000 acres. Environmentally safe disposal of wastes such as waste oil and brine was not yet regulated by law. Wastes such as these were commonly dumped on the land surface.

As oil production decreased, population also decreased, leaving behind many abandoned facilities. Many of these dilapidated structures and the remains of oil production equipment are still scattered over the land. Soils contaminated by past dumping of wastes remain unproductive. The condition of this oil field is a significant threat to public health, soil productivity, water quality, and economic opportunity in the area. Removal of structural debris and reclamation of impacted soils are needed.

The purpose of the North Toole County Reclamation Project, coordinated through the county health department, is to accomplish reclamation of this oil field by removing abandoned structures and debris from impacted sites, assessing technologies for reclaiming oil-contaminated soils, and applying these technologies to a variety of sites. This is an ongoing project to accomplish the dismantling and removal of structures and associated oil-field equipment, the reclamation and revegetation to productive range or croplands, and the development of a planning guide to facilitate future projects throughout Montana.



PROJECT NO. 11

APPLICANT NAME: MONTANA BOARD OF OIL AND GAS CONSERVATION

PROJECT/ACTIVITY NAME: 1996 "B" Orphaned Well Plug and Abandonment and Site Restoration

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING AMOUNTS AND SOURCES:

\$ 10,000 Applicant

TOTAL PROJECT COST: \$ 200,000

RECOMMENDED FUNDING: \$ 190,000

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The purposes of this grant request are to provide funding to plug and abandon orphaned oil and gas wells properly and to perform the surface reclamation. The wells are uneconomic and have the potential to cause damage to subsurface formations, the state's water, and the surface around each well.

The Board of Oil and Gas Conservation will eliminate the threat of contamination by soliciting bids to plug and abandon the wells. Under the supervision of the board's staff, the successful bidder will properly plug and abandon each well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells produced oil and/or gas in the past. The operators could no longer afford to produce the wells, and the wells were shut in. The companies' assets will not cover the liabilities to creditors, leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State. The wells will be properly plugged and abandoned when funding is made available.

The orphaned wells are located throughout Montana. In most cases the wells that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.



PROJECT NO. 12

APPLICANT NAME: MONTANA STATE UNIVERSITY-RECLAMATION RESEARCH UNIT

PROJECT/ACTIVITY NAME: Reclaimed Metal Mine Lands: Agricultural Uses and Restrictions

AMOUNT REQUESTED: S 129,114

OTHER FUNDING AMOUNTS AND SOURCES:

S 50,354 Applicant

TOTAL PROJECT COST: S 179,468

RECOMMENDED FUNDING: S 129,114

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The historic mining and processing of metallic minerals in Montana through environmentally insensitive methods have resulted in a legacy of soil and water contamination. Many mine and smelter sites contain waste materials bearing metallic environmental contaminants such as lead, arsenic, and cadmium. These sites are presently in the process of being reclaimed through various approaches, including capping and in-place revegetation. Revegetation of metal mine sites is often the ultimate objective of reclamation efforts to reduce erosion and prevent the release of contaminants to the environment. Once these areas are reclaimed, their potential uses remain uncertain. In Montana many of these sites may be utilized for agricultural purposes: livestock grazing; alfalfa, hay, and small grain production. Despite the aesthetic and environmental enhancement of vegetation establishment in areas impacted by mining, several recent studies have found that vegetation can accumulate metals in plant tissue and on plant surfaces, resulting in an increased risk of metal exposure to terrestrial receptors and grazers. Since grazing and crop and forage production are the intended end land uses of many reclaimed mine land areas, it is important to evaluate the potential impact of establishing vegetation on reclaimed metal mine lands to agricultural resources.

The overall goal is to evaluate vegetation metal loadings in reclaimed and adjacent unreclaimed mining areas through (1) reviewing the databases that have been generated for metal mine areas that have been reclaimed, and (2) collecting and analyzing site-specific vegetation and soil materials from areas for which sufficient data are lacking. Vegetation metal burdens will be interpreted relative to National Research Council Guidelines (1980) for forage quality for grazing animals. Metal concentrations in grain will be evaluated separately in terms of U.S. Food and Drug Administration Guidelines for dietary trace element concentrations. Soil samples will also be evaluated for metals. Research has demonstrated that grazing animals can consume up to 1.5 kilograms of soil per day as a consequence of vegetation utilization. The importance of each medium, soil and vegetation, will be evaluated in terms of reclamation approach (in-place revegetation versus capping) for metal accumulation in grazing animals. These interpretations will be used to assess which land uses, if any, will be restricted following reclamation and revegetation of these metal-contaminated soils and wastes.

The responsible organization will be the Reclamation Research Unit, Montana State University.

Existing databases and field sampling sites will be selected with the assistance of state and federal agencies across the state of Montana. This research is intended to be broad in scope and not specific to a single mine, mill, or smelter site. The time frame is 24 months from funding procurement.





**PROJECT NO. 13**

**APPLICANT NAME:** MONTANA BUREAU OF MINES AND GEOLOGY

**PROJECT/ACTIVITY NAME:** Training for Environmentally and Economically Sound Resource Development

**AMOUNT REQUESTED:** S 76,043

**OTHER FUNDING AMOUNTS AND SOURCES:**

|          |                                     |
|----------|-------------------------------------|
| S 29,249 | Applicant                           |
| S 16,250 | Fees from participants              |
| S 6,950  | Department of Environmental Quality |

**TOTAL PROJECT COST:** S 102,171

**RECOMMENDED FUNDING:** S 49,722

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

Since the discovery of mineral resources in Montana in the 1850s, most of the deposits have been found to be too small to be developed by the larger companies. Neither technology nor training has ever been available for the operators of small mines.

The objective of this program is to train small operators to develop a small resource successfully while preventing or eliminating any environmental impacts. In addition to providing hands-on training, a video of the program will be produced for future educational use by regulators, managers, and miners.

The training will be conducted by industry specialists under the direction of the Montana Bureau of Mines and Geology. A segment will be presented through the interactive telecommunications network, another segment at Montana Tech, and the remainder in the field on actual projects. Most field work will be in the Butte and/or Helena area.

Subject matter for the training will be scheduled as follows over a two-year period:

1. Cyanide Heap Leach (approximately 25 participants each session) 3 days each spring; 3 days each fall
2. Placer Exploration (approximately 25 participants each session) 6 days each spring
3. Placer Mine Design with Reclamation (approximately 25 participants each session) 6 days each summer
4. Acid Rock Drainage Prevention (approximately 25 participants each session) 3 days each winter



PROJECT NO. 14

APPLICANT NAME: WALKERVILLE, TOWN OF

PROJECT/ACTIVITY NAME: Walkerville's Plan for Development of Reclaimed Mine Properties

AMOUNT REQUESTED: S 113,600

OTHER FUNDING AMOUNTS AND SOURCES:  
S 5,500 Applicant

TOTAL PROJECT COST: S 46,200

RECOMMENDED FUNDING: S 40,700

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

From 1881 until 1959, the area in and around the town of Walkerville was the site of virtually continuous mining and milling activities. The Alice Mine was primarily mined for silver, and the amalgamation process used large amounts of mercury. The waste materials from the mining and milling processes were consolidated in dump areas, which are found throughout the community.

The project calls for the development of several reclaimed mine properties in the town of Walkerville. These include the further development of the recently completed Walkerville Baseball Field, development and installation of an exercise pathway on a mine waste repository, and completion of a basketball/tennis court on top of a cement-encapsulated mine waste dump.

All three components of this project are associated with past mining activities in the town of Walkerville. Walkerville has been the site of much reclamation activity; consequently, there are large vacant areas in Walkerville that have been reclaimed and are not presently in use. Building on these reclaimed sites will not only make the property usable again, but also will protect the reclamation work now in place. The Walkerville Project is important because it demonstrates the viability of redeveloping reclaimed land for beneficial use.

The town council, which represents the citizens of Walkerville, will be responsible for overseeing the development and completion of these projects. The three areas are located in the town of Walkerville.

The project is expected to begin in July of 1997 and will take approximately four months to complete. Once grant funds have been obtained, the town council will follow all Montana laws and appropriate town ordinances. The bids will be let according to these procedures.



**PROJECT NO. 15**

**APPLICANT NAME:** BUTTE-SILVER BOW LOCAL GOVERNMENT

**PROJECT/ACTIVITY NAME:** Travona Mineyard Preservation and Enhancement

**AMOUNT REQUESTED:** \$ 170,280

**OTHER FUNDING AMOUNTS AND SOURCES:**  
\$ 51,830 Applicant

**TOTAL PROJECT COST:** \$ 197,110

**RECOMMENDED FUNDING:** \$ 145,280

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

The historical headframe at the Travona Mineyard (which has played an integral role in the community's past and evolved as a mineral development impact) needs to be restored and preserved due to safety hazards, as a reminder of our history, and as a focal point for the Heritage Park. Without preservation, the headframe will fall into disrepair and eventually have to be removed due to safety reasons. The vegetated areas surrounding the headframe have been restored to a condition of alfalfa and wild grasses. Such vegetation, however, is not compatible with an urban setting and a heritage park concept.

As part of the overall development of the Heritage Park, the headframe of this historical mine will be evaluated, stabilized, and preserved. This activity will be accomplished through an inspection and evaluation of the structure and accessory equipment, through repair and replacement of defective structures and equipment, and, finally, through preservation by preservation priming and repainting of the structures. The mine site area will be landscaped and revegetated with shrubs and trees compatible with an urban heritage park atmosphere and the adjacent neighborhoods.

Butte-Silver Bow will be the organization responsible for carrying out the project. The project is located in the Urban Corridor of Butte-Silver Bow. It is expected that the preservation and revegetation of the Travona Mineyard will take approximately 18 months.





**PROJECT NO. 16**

**APPLICANT NAME:** YELLOWSTONE CONSERVATION DISTRICT

**PROJECT/ACTIVITY NAME:** Watershed Planning in Montana Integrating Geospatial Information

**AMOUNT REQUESTED:** \$ 300,000

**OTHER FUNDING AMOUNTS AND SOURCES:**

|           |                    |
|-----------|--------------------|
| \$ 5,674  | Applicant          |
| \$ 72,146 | Federal agencies   |
| \$ 20,180 | State agencies     |
| \$ 2,000  | Yellowstone County |

**TOTAL PROJECT COST:** \$ 200,000

**RECOMMENDED FUNDING:** \$ 100,000

**PROJECT ABSTRACT:** (Prepared and submitted by applicant.)

A geospatial information system (GIS) is a technical scientific tool used to collect, monitor, and assess complex databases. It is also a nontechnical information resource, much like a public library. GIS is a means of making issues clear and understandable through the development of computer-generated maps that display the relationship between spatial and tabular data.

Geospatial and coordinated natural resource planning committees and task forces created by the Montana Legislature and federal, state, and local governments have all identified the need for interagency collaboration in the development and use of GIS technology for land use planning in Montana.

An identified obstacle to implementing and strategically planning for the growth of GIS in Montana involves the need to establish a statewide GIS framework--including data sharing, data coordination, data access, data collection, and data management.

The Watershed Planning in Montana Integrating Geospatial Information Project sponsored by the Yellowstone Conservation District is designed to address these and other GIS-related issues. The conservation district will field-test a geospatial planning prototype in a watershed area in the greater Yellowstone region.

The geospatial prototype was created by a team of federal and state land planning agencies, lead geospatial researchers from Montana's universities, city and county GIS/planners, and private citizens and planners involved in local watershed planning.

Implementation of the prototype will establish Montana's first comprehensive geospatial-based watershed planning effort that connects environmental, social, and economic data and makes them accessible to local decision makers through a standardized GIS framework. After field testing, the model will be revised to reflect actual field experience and demonstrated to other planning groups in Montana.



THE FOLLOWING PROJECTS ARE NOT RECOMMENDED FOR FUNDING. THE LIST IS ALPHABETIZED BY THE NAME OF THE APPLICANT.

APPLICANT NAME: BUTTE-SILVER BOW LOCAL GOVERNMENT

PROJECT/ACTIVITY NAME: Butte Mine Subsidence Reclamation Project

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING AMOUNTS AND SOURCES:  
\$ 65,237 Applicant

TOTAL PROJECT COST:<sup>1</sup> \$ 365,237

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Historic mining in Butte has created chronic mine subsidence problems that pose serious safety hazards to local residents. Mine openings are likely to occur anywhere north of Front Street, throughout the Uptown District, in the West Side, and north into Centerville and Walkerville. There are more than 4,000 mining claims in the Butte district and 3,500 miles of underground workings. Each of these claims is likely to have at least one discovery shaft, even if no significant mining was done on the claim. There may be more than 1,000 shafts, prospect pits, trenches, and other subsurface voids within residential areas on Butte Hill.

This proposal has been developed to allow Butte-Silver Bow County to respond immediately to known mine subsidence hazards that would otherwise remain hazardous for a year or longer, or not be addressed at all. The county would enlist the services of professionals to examine reported openings and take appropriate action (i.e., capping, backfilling, fencing, posting signs, or combinations of these measures). Those openings in need of more extensive reclamation would be addressed by the State of Montana's Abandoned Mine Reclamation Bureau (AMRB) using federal funding.

To date, the AMRB has done significant work in reclaiming many open shafts in Butte, particularly in the West Butte area. However, as of May 1996, more than 40 holes were open on Butte Hill, many for more than one year. Under existing rules and regulations, the AMRB may not have the jurisdiction nor the resources to take action. Consequently, many open holes have posed and will continue to pose safety hazards to Butte residents, particularly children. The remedial action made possible with funds provided by this grant will help the community respond effectively and eliminate potentially disastrous consequences.

<sup>1</sup>For projects that are not recommended for funding, TOTAL PROJECT COST is the sum of the AMOUNT REQUESTED and the OTHER FUNDING AMOUNTS AND SOURCES.



APPLICANT NAME: DEER LODGE VALLEY CONSERVATION DISTRICT

PROJECT/ACTIVITY NAME: Development of Acid/Heavy Metal Tolerant Cultivars

AMOUNT REQUESTED: \$ 100,000

OTHER FUNDING AMOUNTS AND SOURCES:

|           |   |
|-----------|---|
| \$ 2,500  | Applicant   |
| \$ 43,000 | U.S. Department of Agriculture, Natural Resource Conservation Service, Plant Materials Center |
| \$ 5,000  | Soil and Water Conservation Districts of Montana, Inc.  |

TOTAL PROJECT COST: \$ 150,500

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The unavailability of plants that can withstand the severity of acid-and/or heavy-metal-contaminated soils or wastes has motivated the origin of a project to develop new cultivars that demonstrate an inherent tolerance to these contaminated conditions. The Development of Acid-Tolerant Cultivars is a project previously funded by a grant from the Montana Department of Natural Resources and Conservation. This grant application is being completed in the hope of securing further funding for this most important project. Its goal is to develop plant cultivars that have the ability to grow on acidic and/or heavy-metal-contaminated sites. Once potentially tolerant plants have been collected, they are tested in the field. Two test sites in Anaconda, Montana, and one test site in East Helena, Montana, were constructed for the testing of candidate species. Collections passing the field evaluation phase of the study are then put into seed increase at the Bridger Plant Materials Center. Once a seed source has been established and the progeny tested for performance, further testing will be performed in preparation for its release as a new cultivar. Released cultivars will then be made available to seed producers as foundation seed stock (or some other level of seed classification). The seed producer will then be able to market this valuable new cultivar to the general public.

A total of 89 seed and plant collections were made throughout the summer and fall of 1995. Seed germination and dormancy studies have also been completed and have provided some very useful data. These collections and the 1996 summer collections will require two more years of project time for planting and evaluation.





APPLICANT NAME

LEWIS AND CLARK COUNTY WATER QUALITY PROTECTION DISTRICT

PROJECT/ACTIVITY NAME: Tennile Mine Site Reclamation Project, Phase IIAMOUNT REQUESTED: \$ 268,121OTHER FUNDING AMOUNTS AND SOURCES:

|           |   |
|-----------|---|
| \$ 18,459 | Applicant   |
| \$ 10,985 | Montana Department of Environmental Quality,<br>Abandoned Mine Reclamation Bureau |

TOTAL PROJECT COST: \$ 297,565RECOMMENDED FUNDING: \$ 0PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Heavy rainfall and snowmelt during the spring and summer of 1993 caused water to back up within the Tennile Mine adit. Water pressure within the adit forced a plug "blowout," causing several hundred cubic yards of mine tailings, waste rock, mud, and debris to slide down the steep hillside, over a large section of Montana Department of Environmental Quality (DEQ) reclaimed land, and into Tennile Creek. The Tennile Water Treatment Plant stream intakes are located approximately 1 mile downstream of the slide area.

In addition to creating turbidity during periods of high runoff, the slide materials contain toxic and heavy metals that continue to pollute Tennile Creek. These pollutants include arsenic, lead, cadmium, and zinc. Acidic leachate from the tailings slide continues to pose an imminent threat to water and aquatic life in the creek.

Project work, financed by the U.S. Forest Service and DNRC/RDGP grant moneys during the summer of 1996, has focused on removal of the mud and rock slide materials from Tennile Creek and stabilization of the impacted stream bank. However, the remaining portion of the slide and continued acid mine drainage must be addressed. Proposed project work will focus on reducing the adverse impacts to the creek from turbid and metal-laden run-on/runoff or leachate originating at the site of the slide. Adverse impacts will be mitigated by a combination of source reduction and surface reclamation. Portions of the slide materials will be relocated away from the creek, erosion paths will be recontoured and stabilized, sediment traps will be constructed, and the site will be revegetated. Adit drainage controls will also be implemented to collect and re-route water that would otherwise leach and move heavy metals into Tennile Creek.

The work plan includes a monitoring and assessment program to evaluate effectiveness of the project and collect needed data on the flow rate and chemical characteristics of the adit drainage water. If successful, this program will serve as a paradigm for other reclamation projects in the Tennile and other Montana watersheds impacted by abandoned mine sites.





APPLICANT NAME: MISSOULA, CITY OF

PROJECT/ACTIVITY NAME: Glacial Lake Missoula: An Untapped Natural Resource Opportunity

AMOUNT REQUESTED: \$ 166,089

OTHER FUNDING AMOUNTS AND SOURCES:

|           |                                     |
|-----------|-------------------------------------|
| \$ 5,000  | Applicant                           |
| \$ 54,000 | U.S. Forest Service                 |
| \$ 70,835 | Montana Bureau of Mines and Geology |

TOTAL PROJECT COST: \$ 295,924

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Glacial Lake Missoula was an ice-age lake that formed several times during the glacial history of western Montana. It last existed about 12,700 years ago. Its maximum depth was approximately 2,100 feet, at which time it contained approximately 500 cubic miles of water. In Missoula, its depth reached 950 feet, based on the wave-cut shorelines on Mount Sentinel and Mount Jumbo. Glacial Lake Missoula covered about 3,000 square miles of western Montana. Beginning at an ice dam in northern Idaho a few miles west of Heron, Montana, it reached eastward to the Mission Range, southward to the southern end of the Bitterroot Valley, and southeastward as far as Garrison, Montana.

This project is a crucial state need because it will enhance Montana's economy through the interpretive development of one of the state's lesser known natural resources - the remaining evidence of Glacial Lake Missoula. In addition, it will develop, promote, protect, and further Montana's total environment and ensure the welfare and public resources of Montana citizens and communities.

The goal of this project is to tell the story of Glacial Lake Missoula, including its effect on our landscape, settlement history, water resources, and economics. To attain this goal, this project will produce three tangible products. A well-illustrated travel guidebook will be generated emphasizing Glacial Lake Missoula and other key historical features that will be enjoyed by Montana citizens and millions of nonresident visitors. A brochure will also be developed and distributed in key locations. The brochure will give an introduction to Glacial Lake Missoula and its role in the great floods of the Pacific Northwest. The third product is a catalogue of sites that best tell the Glacial Lake Missoula story. The catalogue will include a pictorial and geologic description that discusses the significance of each site. This catalogue can be used to identify sites for future interpretive development such as roadside stops.

By telling the story of Glacial Lake Missoula, we can help preserve part of our heritage. This project will also promote economic growth by detaining visitors in Montana through the use of the travel guidebook. If these visitors each spend just one more dollar, Montana's citizens can benefit from an increase in revenue of potentially \$4.9 million.



APPLICANT NAME: MONTANA BOARD OF OIL AND GAS CONSERVATION

PROJECT/ACTIVITY NAME: 1996 "C" Orphaned Well Plug and Abandonment and Site Restoration

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING AMOUNTS AND SOURCES:  
\$ 10,000 Applicant

TOTAL PROJECT COST: \$ 310,000

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The purposes of this grant request are to provide funding to plug and abandon orphaned oil and gas wells properly and to perform the surface reclamation. The wells are uneconomic and have the potential to cause damage to subsurface formations, the state's water, and the surface around each well.

The Board of Oil and Gas Conservation will eliminate the threat of contamination by soliciting bids to plug and abandon the wells. Under the supervision of the board's staff, the successful bidder will properly plug and abandon each well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells produced oil and/or gas in the past. The operators could no longer afford to produce the wells, and the wells were shut in. The companies' assets will not cover the liabilities to creditors, leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State. The wells will be properly plugged and abandoned when funding is made available.

The orphaned wells are located throughout Montana. In most cases the wells that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.



APPLICANT NAME: MONTANA BUREAU OF MINES AND GEOLOGY

PROJECT/ACTIVITY NAME: Oil and Gas Potential along the Fromberg Fault Zone, South-Central Montana

AMOUNT REQUESTED: S 95,139

OTHER FUNDING AMOUNTS AND SOURCES:

S 55,121 Applicant

TOTAL PROJECT COST: S 150,260

RECOMMENDED FUNDING: S 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The Fromberg Fault Zone extends from near Red Lodge to just south of Billings. It appears to be part of a northeast-trending, basement-controlled structure that traverses the northern Bighorn Basin and forms the northern edge of the Pryor-Bighorn uplift. The zone has been long recognized, but it has never been completely described or fully understood. It appears to have exerted fundamental control on structural and stratigraphic features in the area. Structures associated with the zone trap oil at Mosser Dome field, located southeast of Billings. Proposed research will focus on unresolved structural problems and the complete understanding of the geologic controls for Mosser Dome field. The Fromberg Fault Zone may be part of a regionally important basement zone of weakness that may extend into the Williston Basin. It probably exerts similar geologic controls in that area. The zone, therefore, also may have important associations with oil and gas accumulations along its northeast extension.

The intended main objectives of this project are a comprehensive interpretation of the Fromberg Fault Zone and its northeast extension and a description of its relation to oil and gas accumulations. The main goal of the project is for its results to be applied by the oil and gas industry to the exploration for and the responsible development of new oil and gas reserves, thereby stimulating the oil and gas exploration industry in Montana.

The Montana Bureau of Mines and Geology is responsible for carrying out this project.

The study will encompass the region of the eastern Beartooth Mountains northeastward into the Williston Basin, along the trend of the Fromberg Fault Zone.

The project is designed to be completed in two years, beginning July 1998.





APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ ACTIVITY NAME: Nonpoint Source Pollution Control In Montana

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING AMOUNTS AND SOURCES:

|             |  |
|-------------|--|
| \$ 31,680   | Applicant                                  |
| \$ 30,744   | Conservation districts                     |
| \$ 99,985   | U.S. Natural Resource Conservation Service |
| \$1,394,800 | U.S. Environmental Protection Agency       |

TOTAL PROJECT COST: \$1,857,209

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Despite Montana's bountiful water resources and national reputation for pristine trout streams, nonpoint source (NPS) pollution is threatening water quality in hundreds of streams and stream segments throughout the state. This proposal is to provide resources to assess, target, and restore these damaged rivers and streams by providing project-by-project technical and educational assistance.

NPS pollution accounts for over 90 percent of the total water pollution in Montana. Twenty-five percent of Montana's perennial streams and 75 percent of its lakes are impaired from NPS pollution. Montana has more miles of polluted streams than any other state in the nation except Oregon (*EPA's 1990 National Water Quality Inventory*).

Section 319 of the Federal Water Quality Act (WQA) of 1987 authorized financial assistance to states to help them implement NPS pollution control programs. Following the development of a state NPS Assessment Report and a NPS Management Plan the Water Quality Bureau of the Department of Health and Environmental Sciences (DHES) became eligible for financial assistance on a 60-percent-federal/ 40-percent-state match basis. (In July 1995, this bureau was reorganized and placed in the new Montana Department of Environmental Quality [DEQ]). These documents outline strategies for Montana to address NPS problems.

There has been an increasing interest in watershed management in the past several years and a similar increase in the number of requests for assistance to assess NPS pollution in local watersheds. These requests are usually to help plan and implement projects that reduce or eliminate NPS pollution through the use of proper resource management measures or Best Management Practices (BMPs). Montana's NPS Management Plan emphasizes the need for technical and financial assistance to help land users implement BMPs under a nonregulatory program.

The funds requested in this proposal are crucial to the success of an effective NPS program in Montana. These funds will serve as leverage for federal 319 match funds and private contributions obtained by DEQ. Examples of projects that are pending include:

1. Watershed projects - planning and implementation of watershed plans to address priority water quality problems
2. Demonstration projects showing new BMP technology
3. Nonpoint source water body assessments and water quality monitoring of selected waters



4. Watershed planning for total resource management
5. "Capacity building" for conservation districts (CDs) and other local watershed project sponsors

This list is just a representative sample of the water quality project assistance that local groups are requesting. If state match funds are not available, Montana will not be able to obtain federal funding for NPS pollution control. By combining state and federal resources, DEQ will be in a proactive position to help Montana residents solve their NPS water quality problems.

APPLICANT NAME: MONTANA STATE UNIVERSITY - EXTENSION SERVICE

PROJECT/ACTIVITY NAME: Montana Local Government Pollution Prevention Assistance Project

AMOUNT REQUESTED: \$ 284,292

OTHER FUNDING AMOUNTS AND SOURCES:

|            |                                      |
|------------|--------------------------------------|
| \$ 104,389 | Applicant                            |
| \$ 86,000  | U.S. Environmental Protection Agency |

TOTAL PROJECT COST: \$ 474,681

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Environmental issues affecting the quality and quantity of natural resources are reaching every corner of the state, confronting communities with problems for which there are no easy solutions. Within each local government, opportunities exist to prevent wastes and control negative environmental impacts to communities and their citizens. Common city/county infrastructure facilities where cost-effective pollution prevention opportunities exist include the water utilities department, buildings, street and road maintenance, fleet maintenance, parks and recreation department, fire and police departments, health department, solid waste facilities, and sewage treatment plant.

The goal of this project is to provide all Montana cities and counties with resources and technical assistance to establish and sustain a local government pollution prevention assessment action plan and program. This project will be conducted statewide by the Montana Pollution Prevention Program, which is based in Montana State University-Bozeman, and it will be implemented by the Extension Service's network of offices. The project will be implemented in cooperation with the Montana Association of Counties and the Montana League of Cities and Towns.

The Montana Pollution Prevention Program is a nonregulatory, technical assistance program of the Montana State University Extension Service. The Pollution Prevention Program, through the Extension service, consists of 53 offices statewide, serving Montana's 56 counties as well as 4 Indian reservations. Since the creation of the Pollution Prevention Program in 1992, the program has already achieved significant multi-media waste minimization and prevention results. Program highlights include providing direct technical assistance to over 1,500 small businesses (dry cleaners, carbody and repairshops, printers, construction companies, hotel/motel facilities), hosting the nation's first tribal pollution prevention conference, and developing a waste minimization program for Montana schools.

This project is a 24-month effort with follow-up and guidance from the Montana Pollution Prevention Program



continuing after the funding cycle.

APPLICANT NAME: MONTANA STATE UNIVERSITY-RECLAMATION RESEARCH UNIT

PROJECT/ACTIVITY NAME: Reclamation of Acid-Producing Mining Wastes Utilizing Industrial By-Products

AMOUNT REQUESTED: \$ 297,289

OTHER FUNDING AMOUNTS AND SOURCES:  
\$ 115,943 Applicant

TOTAL PROJECT COST: \$ 413,232

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

There is a general perception that deep drainage from infiltration/percolation of precipitation into vegetated mine wastes in the semiarid west is not a problem due to evapotranspiration rates that exceed annual precipitation amounts. This has lead to construction of some mine waste repositories that actively produce acid drainage, which in turn has lead to vegetation mortality, erosion, and widespread water quality degradation. Acid drainage has resulted in many miles of streams in Montana that are devoid of life, are of inadequate quality for irrigation, and are unsuitable for most other beneficial uses. Proper design of repositories for acid-producing materials requires either isolation from the environment or characterization of the wastes and complete neutralization of both potential and active acidity. Industrial calcium oxide and calcium carbonate are typically used for amendments and generally represent a substantial portion of the reclamation costs.

The goals of this research are to develop more cost-effective reclamation of acid-producing mining waste and to provide environmentally sound disposal of some industrial waste products. The objective of this proposal is to evaluate several industrial waste products (quicklime kiln waste, sugar beet processing waste, two types of magnesium manufacturing waste, and cement kiln waste:

- (1) For their effectiveness in ameliorating acid production in a coal waste repository
- (2) To evaluate the suitability of the resulting medium for sustained vegetation production
- (3) To quantify the effect of the established vegetation on the soil moisture regime within the repository

Use of industrial wastes could provide a means for their utilization and disposal, reduce environmental problems associated with their storage, and result in substantially reduced reclamation costs, especially in project areas close to industrial waste sources.





APPLICANT NAME: NORTH POWELL CONSERVATION DISTRICT

PROJECT/ACTIVITY NAME: A Watershed Approach for Mine Waste Cleanup in the Blackfoot Basin, Montana

AMOUNT REQUESTED: \$ 180,000

OTHER FUNDING AMOUNTS AND SOURCES:

|           |  |
|-----------|--|
| \$ 36,000 | Applicant                              |
| \$ 9,500  | Department of Environmental Quality    |
| \$ 4,500  | Department of Fish, Wildlife and Parks |
| \$ 7,000  | U.S. Bureau of Land Management         |
| \$ 7,000  | U.S. Forest Service                    |

TOTAL PROJECT COST: \$ 244,000

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The Blackfoot Challenge is a consensus-based, watershed management organization in the Blackfoot River basin, Montana. The North Powell Conservation District is one of over 300 members of the challenge, including three county governments, two other conservation districts, several state and federal agencies, and over 250 private landowners in the Blackfoot valley. The challenge has initiated a collaborative effort to address abandoned and inactive mine reclamation and mine waste cleanup in the watershed. The project will focus on two critical issues: (1) the collaborative or "people" processes that will accomplish abandoned hardrock and placer mine reclamation, and (2) the characterization and restoration of priority sites impacting water quality in impaired tributaries. This project will be the first in Montana to address mine waste cleanup on a watershed basis.

The Blackfoot River watershed has many problems related to inactive and abandoned mines. In the 2,500 square miles (1.5 million acres) in this western Montana watershed, these sites cause some of the most serious water quality impairment and general environmental degradation problems needing attention. At the headwaters of the river, for example, many sites have polluted the river for over 100 years. The Mike Horse Mine adit discharge to Beartrap Creek is considered by many to be the "poster child" of abandoned mines because of its nationwide celebrity. Similarly, many sites in the headwaters and elsewhere in the drainage are considered to be problems worthy of attention.

The goals of the project are: (1) to work with the interested local stakeholders including private landowners and agency representatives, to help organize and facilitate a cooperative process to address mine waste pollution in the Blackfoot River watershed; (2) to develop and implement a collaborative priority-setting process wherein a single priority list of abandoned (and inactive) sites will be established; (3) to establish a collaborative process wherein a basin-wide strategy can be established and adopted by all involved entities that will better characterize priority sites, establish environmental indicators of cleanup success, and implement mutually agreed-upon remediation actions; and (4) to transfer both the collaborative processes information and the cleanup technology information from this watershed-based project to a region-wide or statewide application for improved pollution prevention and environmental remediation.

The project will begin in June 1996 utilizing other funding sources and will be completed in September 1999. The





requested RDGP funds will be used in the period from July 1997 through September 1999.

APPLICANT NAME: ROSEBUD CONSERVATION DISTRICT

PROJECT/ACTIVITY NAME: Hydrologic and Geologic Feasibility of Coal-Mine Pits as Water Impoundments

AMOUNT REQUESTED: \$ 282,443

OTHER FUNDING AMOUNTS AND SOURCES:

|            |                                     |
|------------|-------------------------------------|
| \$ 3,675   | Applicant                           |
| \$ 167,325 | Montana Bureau of Mines and Geology |

TOTAL PROJECT COST: \$ 453,443

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

Leaving portions of the final pits of coal mines as water impoundments and bluffs would benefit both mining companies and users of the land after reclamation. The objective of this project is to build scientific methods and guidelines that will be used to encourage this reclamation technique. The published results of the project will be used by coal mining companies, landowners, and government regulators for assessing the hydrologic and geologic feasibility, as well as the economic desirability, of final-pit impoundments. In certain situations impoundments would create beneficial landscapes for stock and recreation uses and habitat for wildlife. Ranchers, natural resource managers, and mining companies support this reclamation concept.

The main focus of this proposal is ponds in final mine pits that are fed by groundwater. A secondary focus is the retention of highwalls, which would form bluffs as one shore. Retention of impoundments and bluffs is supported by both mining companies and landowners. Regulations currently require advance proof of stability and longevity for any deviation from the reclamation practice of leaving low-angle, smoothed topography. However, due to a lack of adequate methods for predicting impoundment static water levels, water quality, and bluff stability, regulators are hesitant to permit these reclamation methods.

The Rosebud Conservation District will administer the project and oversee the activities of the Montana Bureau of Mines and Geology personnel who will perform the actual scientific investigation.

The project will focus on an inventory of mine impoundments throughout southeastern Montana, with detailed work at two existing mine-pit impoundments. One is near Colstrip, in Township 1 North, Range 41 East, Section 27. The other will be identified during the inventory of existing coal-mine impoundments in Montana.

A project duration of 24 months will be required. Monitoring will occur during the entire duration. Interpretation and reporting will be done during the final 6 months.



APPLICANT NAME: UNIVERSITY OF MONTANA - GEOLOGY DEPARTMENT

PROJECT/ACTIVITY NAME: Gold Resource and Groundwater Contamination of the Judith Mountains: An Evaluation Plan

AMOUNT REQUESTED: \$ 39,799

OTHER FUNDING AMOUNTS AND SOURCES:  
\$ 25,186 Applicant

TOTAL PROJECT COST: \$ 64,985

RECOMMENDED FUNDING: 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

The Judith Mountains, located northeast of Lewistown, are part of the important gold-bearing north-central Montana alkali igneous rock province of late Cretaceous/early Tertiary age. Presently, large quantities of gold and silver are being extracted from the Zortman-Landusky deposits in the Little Rocky Mountains. In the Judith Mountains, significant gold-silver production (>700,000 ounces of gold) has come mainly from deposits in and adjacent to igneous plutons. The district, presently inactive, has great potential-- in light of new deposit-type gold discoveries (e.g., near Carlin, Nev.) and modern ore genesis theories-- of containing large tonnage, low grade gold and silver deposits within the Paleozoic carbonate/clastic rocks (approximately 50 square kilometers of which are exposed) that surround the central and southern half of the igneous-rock-cored hills.

Furthermore, should mining resume, the potential exists for major aquifer pollution from mining and ore processing, which occurred as recently as the 1980s at the Giltedge deposit and on Ford Creek.

The goal of this study is to ascertain the precious metal potential of the area. Our objectives are to: (1) delineate the areas within the carbonate rocks surrounding the igneous intrusions with the greatest potential for sediment-hosted deposits by doing detailed surface geologic mapping, whole rock geochemistry, and thin section and SEM petrography, and (2) determine the stratigraphic/structural settings in these more favorable zones in order to rate them with regard to porosity/permeability characteristics for transmitting contaminated fluids containing cyanide and/or toxic metals.

The work will be done during the summers of 1997 and 1998, and finished during the spring of 1999, by researchers from the University of Montana and the University of New Mexico, who have studied and written extensively about the geology, structure, and mineral deposits of central Montana, including the Judith Mountains.



APPLICANT NAME: YELLOWSTONE COUNTY

PROJECT/ACTIVITY NAME: South Billings Boulevard Gravel Pit Reclamation

AMOUNT REQUESTED: \$ 300,000

OTHER FUNDING AMOUNTS AND SOURCES:

|           |           |
|-----------|-----------|
| \$ 31,000 | Applicant |
|-----------|-----------|

TOTAL PROJECT COST: \$ 331,000

RECOMMENDED FUNDING: \$ 0

PROJECT ABSTRACT: (Prepared and submitted by applicant.)

This applicant seeks Reclamation and Development Grant funds for the purpose of reclaiming land currently used as a gravel pit. The present quarry operation is required to reclaim the disturbed area and return a public "natural" resource to the people of Montana.

The overall goal will be to reclaim the quarry site and develop it for future recreational uses. Objectives will be to: (1) improve and protect the natural landscape, such as sensitive river riparian areas; (2) consider potential options and/or environmental constraints when developing the final design plans for reclamation; and (3) unite financial resources and solicit support of neighboring landowners so project activities do not conflict with the comprehensive plans of government.

Yellowstone County, the City of Billings, and the Yellowstone River Parks Association will provide administrative overview and serve as project coordinators. Yellowstone County can legally enter into a contract with the Montana Department of Natural Resources and Conservation.

The Yellowstone River/South Billings Boulevard gravel pit and crushing operation are approximately three-quarters of a mile from the South Billings Interchange for Interstate Highway 90. The legal description is Tract 1 of Certificate of Survey No. 2649 on file in the Clerk and Records Office for Yellowstone County. The land or property is made up of part of Lot 1, the SE¼ of Section 17, and Lot 2 of Section 20, Township 1 South, Range 26 East, of the Montana Principal Meridian, in Yellowstone County, Montana.

The time line is from January 1, 1998, through December 31, 1998. Project activities will be completed within 12 months.





## CHAPTER III

### STATUS REPORT OF 1987-1995 PROJECTS

This chapter briefly summarizes the status of active projects and those projects that have been completed since preparation of the January 1995 legislative report. The projects are grouped according to the year in which they received legislative approval; within each such grouping, the projects are presented in the order of their relative funding priority. At the end of the chapter is Table 2, which shows funding information for all authorized projects.

#### Projects Approved by the 1995 Legislature

##### **1. Department of Natural Resources and Conservation/Abandoned Mine Reclamation Project**

This project involved the collaborative efforts of the DEQ, USFS, City of Townsend, and DNRC to reclaim the Vosburg Mine site. The site contained extremely high levels of arsenic and heavy metals requiring proper disposal and containment in a mine waste repository. The deaths of 22 cattle were attributed to the high arsenic concentrations found in the Vosburg Mine tailings and waste rock. The project was successfully completed during the summer of 1995 at a cost exceeding \$1.5 million. The RDGP grant in the amount of \$300,000 was used exclusively for construction cleanup costs.

##### **2. Montana Board of Oil and Gas Conservation/Devil's Basin: Plug, Abandonment, and Restoration**

The contract should be awarded to a plugging contractor in December 1996. Completion is anticipated in the spring of 1997. The purpose of this grant is to plug and abandon 17 oil wells in the Devil's Basin field in Musselshell County and 2 wells in Richland County southeast of Sidney, Montana.

##### **3. Montana Board of Oil and Gas Conservation/South Cut Bank Field - A: Plug, Abandonment, and Restoration**

The contract for plugging was awarded to General Well Service, Inc. in October 1996. Project completion is scheduled for August 1997. The purpose of this grant is to plug and abandon 17 oil and gas wells in Glacier County.

##### **4. Montana Board of Oil and Gas Conservation/South Cut Bank Field - B: Plug, Abandonment, and Restoration**

The contract for plugging was awarded to General Well Service, Inc. in October 1996, and the project should be completed by August 1997. The purpose of this grant is to plug and abandon 21 oil wells in Glacier County.

##### **5. Department of State Lands/Oil Well Abandonment**

The contract for plugging was awarded to General Well Service, Inc. in October 1996, and the project should be completed by August 1997. The Board of Oil and Gas Conservation is administering this project for the applicant. The purpose of this grant is to plug and abandon 7 wells in Glacier County.



## **6. Lewis and Clark County-City of Helena/Tenmile Mine Site Reclamation Project**

The project is under contract and should be completed by January 1, 1997. Work associated with this mine site remedial action involves excavation of waste rock materials in Tenmile Creek and disposal at a stable location, appropriate erosion controls, and site revegetation. An engineering consultant has been hired by USFS to complete final design specifications and prepare the final bid package. The project which was advertised for bid during October 1996 represents a collaborative effort between the applicant and USFS. USFS has contributed funding for (1) preparation of Superfund documents identifying reclamation alternatives feasible for the site, (2) design preparation, and (3) construction. The RDGP grant in the amount of \$75,000 will be used primarily for site construction, with a small amount used to assist the applicant in project administration.

## **7. Montana State University/Clean Tailings Reclamation**

The project is under contract and is expected to be completed January 31, 1998. This project will test a new mineral mine reclamation technique that separates sulfide mineral contaminants from mine tailing material. This new method uses a field-deployable mineral separation technology. Sulfide mineral contaminants are contributors to acid mine drainage.

## **8. Cascade County Conservation District/Muddy Creek Water Quality Improvement**

The project is under contract and is scheduled to be completed by December 1997. Most of the structures are in place. This project funds the implementation of best management practices and installation of sediment reduction structures in a reach of Muddy Creek near Vaughn, Montana.

## **9. Department of Environmental Quality/Nonpoint Pollution Control**

This project has not been contracted; no funds have been disbursed. This project will fund several of Montana's voluntary nonpoint source pollution control projects. Funds will be used for watershed project implementation, water body assessment, training, educational materials, and technical assistance.

## **10. Butte-Silver Bow Local Government/Upper Clark Fork Basin: Superfund Technical Assistance**

This grant is under contract, and the completion date is September 1997. This grant has allowed Butte-Silver Bow to hire a technical specialist to provide policy, procedural, and technical assistance to the local governments of Silver Bow, Deer Lodge, Granite, and Powell Counties, who are expected to assume long-term responsibility to protect and maintain many of the Superfund cleanups in the upper Clark Fork River basin. The technical specialist keeps the local governments up-to-speed on Superfund cleanups, technical comments on behalf of the counties participates in technical and public meetings, and provides technical support to the educational efforts of several local groups including the Deer Lodge Valley Superfund Task Force, the Berkeley Pit Public Education Committee, and the Streamside Tailings/Greenway Information Committee.

According to the counties, the position has been invaluable. A summary of reported activities is too lengthy to include in this report, but is available from DNRC.

## **11. Montana State University Extension Service/Pollution Prevention Program**

This project will be completed June 1997. This project's goal is to work with small businesses in Montana to



reduce the amount of waste, such as packaging waste, waste oil, and dry cleaning fluid, that is being generated. This is being done through a proactive education outreach program.

#### **12. Glacier County Conservation District/Water Quality Demonstration and Reclamation, Red River Drainage**

This grant will be contracted in spring 1997. The cleanup, reclamation, and remediation proposed under this project will occur after site selection is performed during the Evaluation Phase. The Evaluation Phase is part of the U.S. Environmental Protection Agency's 319-funded program that is currently ongoing. The Montana Bureau of Mines and Geology expects to select the site for this project in spring 1997.

#### **13. Toole County/North Toole County Reclamation Project**

This project is under contract and will be completed and the remaining sites reclaimed during the spring of 1997. The purpose of this project is to reclaim 12 abandoned oil and gas sites in Toole County. The cleanup and reclamation include removing and disposing of surface debris, buildings, tanks, equipment, and other assorted junk from each location and grading, topsoiling, and seeding surface disturbances. Four of the site locations were completed in October 1996.

#### **14. Department of Natural Resources and Conservation/Scobey Reclamation Site**

This project is under contract and will be completed in December 1996. This project will reclaim an abandoned gravel pit and wash site near Scobey, Montana. (The Department of State Lands was awarded this project. In July 1995, that department became part of the new Department of Natural Resources and Conservation.)

#### **15. Petroleum County Conservation District/Petroleum County Artesian Basin GroundWater Project**

This project is under contract, and the completion date is May 1998. The project, designed to conserve water in Petroleum County, was started during the summer of 1996 and is sponsored by the Petroleum County Conservation District (PCCD). The purpose of this project is to reduce discharges from flowing wells by repairing those that can be fixed and properly plugging and abandoning unused flowing wells. All work will be conducted under a cost-share program, with the RDGP grant paying 77 percent and the landowner paying 23 percent of the plugging or repair costs. Costs associated with the preliminary assessment of wells will be paid directly by the RDGP grant.

Tasks associated with Objective 1 (summarizing the well inventory, which was paid for by a DNRC 223 grant) and Objective 2 (rehabilitating the well) were started this summer. The results of Objective 1 have been put into a spreadsheet, and the records will be merged into the MBMG groundwater information center (GWIC) database following a final error check. Many new wells were identified that were not identified on existing databases; in addition, old records with well locations that could not be verified were identified and will be flagged in the database. A base map has been constructed in ARC/INFO GIS to facilitate the use of computer generated maps using the newly updated data. Objective 1 is about 30 percent to 40 percent complete. Once the corrected data are input into GWIC, the remaining tasks of this objective will be easily completed.

Tasks associated with the Objective 2 included conducting preliminary site assessments at 27 wells. In the case of most of these wells, the landowners have submitted applications to the conservation district requesting to participate in the project. Other wells include potential monitoring wells and sites that demonstrate new methods of freeze-proofing wellheads. Currently 12 landowners have submitted applications expressing an interest in participating in this program. Meetings have been held with 8 of these landowners. The initial site assessments





include inspecting the condition of the well casing at land surface, measuring well depths (up to 500 feet), measuring flow rate, measuring water level of shut-in pressure, measuring field water chemistry parameters, and inspecting the casing integrity at several wells by running a downhole video camera (maximum depth 500 feet). Less than 1 percent of the Objective 2 tasks have been completed. Several of the wells recently inspected are prime candidates for repairs or plugging. Repair or plugging plans have initially been discussed with many of the landowners. PCCD will attempt to formalize an agreement with each of the well owners to start the rehabilitation process. In many cases this will first involve deciding what needs to be accomplished at a well followed by calculating a cost estimate for the proposed work. The PCCD will soon have information to help develop cost estimates, but final estimates will be established by the well owner and his contractor. PCCD will review the work plan and bid estimate prior to final approval.

### Projects Approved by the 1993 Legislature

#### **1. Montana Board of Oil and Gas Conservation/Kevin-Sunburst Plugging and Reclamation Project**

The wells were plugged, and the project was successfully completed in November 1995. The purpose of this grant was to plug and abandon 26 oil and gas wells in Toole and Liberty Counties.

#### **2. Montana Board of Oil and Gas Conservation/Cat Creek Plugging and Reclamation Project**

This grant is under contract and will be completed July 1997. The purpose of this grant was to plug and abandon three oil and gas wells in Petroleum County. These three wells have been completed (November 1994) at less cost than originally estimated. The remaining grant funds (\$169,421) will be used to plug other orphaned wells in the Cat Creek area.

#### **3. Governor/Lieutenant Governor's Offices/The Montana Consensus Council**

The RDGP grant contract has been completed. The Montana Consensus Council provides training, consultation, and mediation services designed to resolve complex, multi-party natural resource and other public policy issues important to Montanans. To date, the council has helped Montanans build agreement on:

- Administrative rules governing recreational access to state school trust lands
- A law that allows the leasing of water rights to benefit fisheries
- Suggested amendments to reauthorize the federal Endangered Species Act

Current efforts include helping citizens and leaders build agreement on:

- Public land use and growth management in Beaverhead County
- Water use in the Big Hole River watershed
- Potential changes to the Major Facility Siting Act
- An alternative liability scheme to clean up state Superfund sites
- Wilderness and federal land use
- Interstate management of the Missouri River
- The process of reviewing and permitting subdivisions in the City of Helena
- Zoning regulations in Jefferson County
- Range management in the Castle Mountains





The council has improved the ability of Montanans to solve common problems through consensus processes by convening several workshops and training hundreds of people. The council has also produced more than ten books, articles, and reports on the use of consensus to resolve public policy issues. For a complete list of publications, please contact the Montana Consensus Council.

The council is currently examining how the organization can be refined to maintain its effectiveness and improve its financial sustainability. Establishment of a nonprofit 501(c)(3) corporation is one such step. The council invites input and advice on its proposed refinements to its organizational structure.

#### **4. Broadwater Conservation District/Whites Gulch Placer Mine Reclamation Project**

The Whites Gulch project was successfully completed during the summer of 1995 by the Broadwater Conservation District and the U.S. Forest Service. Populations of westslope cutthroat trout have dramatically improved, the stream channel has been stabilized, and overall water quality has increased. The project involved volunteer work from several youth groups, and the site continues to be a focus for interpretive tours explaining placer mine reclamation/fish habitat restoration.

#### **5. Toole County/North Toole County Oil Field Reclamation Project**

Closeout of this grant is expected in December 1996. Initially, 6 abandoned oil and gas sites were reclaimed under this project. An additional 12 sites have been inventoried and designs for construction prepared. The bids were opened in July 1996. As of October 1996, 11 of these sites have been completed.

#### **6. Montana Department of Fish, Wildlife and Parks/Elk Creek Placer-Mined Channel Reconstruction**

The project has been completed. The Department of Fish, Wildlife and Parks reconstructed approximately 3,000 feet of the Elk Creek stream channel near Garnet, Montana. Historical placer mining had destroyed the original channel and eliminated surface flow along three stream reaches. The stream channel was reestablished and riparian areas restored to enhance the stream fishery. The site is a demonstration area on how to implement best management practices on streams damaged by placer mine operations. Monitoring of the project will continue through January 2001.

#### **7. Town of Columbus and Town of Joliet/Waste Stream Reduction-Oil Recycling**

The project will be completed in July 1998. The purpose of this project is to establish a pilot waste-oil collection center in six Montana communities. Centers are located in Big Timber, Boyd, Glasgow, Glendive, Park City, and Sidney, and each community has signed a three-year waste-oil collection agreement with a private waste-oil processing company. Informational dissemination regarding the benefits of the project including newspaper coverage, brochures, pamphlets, and periodic newsletters, has been impressive.

#### **8. Carbon Conservation District/RC&Ds Affecting Change through Local Leadership**

This project is under contract and will be completed in early 1997. This project funds the seven RC&Ds around the state to complete regional rural economic development plans. The Montana State Association of RC&Ds will be using these funds to complete a statewide economic development plan based on the regional plans. This project also includes conducting workshops and initiating 35 specific projects. Six of the seven regional RC&Ds have completed their plans. Statewide plan development is in progress, and workshops have been completed. Over 35 projects have been initiated.



## **9. Montana Department of Environmental Quality/Nonpoint Source Pollution Control in Montana**

This project is underway and scheduled to be completed in June 1997. This project will fund several of Montana's voluntary nonpoint source pollution control projects. Funds are being used for watershed project implementation, water body assessment, educational materials, and technical assistance.

## **10. Montana Bureau of Mines and Geology/Acid Mine Drainage Prevention, Control, and Treatment Technology Development for the Stockett/Sand Coulee Area**

This project is under contract and will be completed in November 1997. The project will assist the State of Montana with development of a methodology to ameliorate acid mine drainage problems associated with abandoned mines located in the Stockett/Sand Coulee area. The first step in controlling the highly acidic water discharging from abandoned coal mines in the Stockett/Sand Coulee area is to develop a thorough understanding of the hydro geologic setting and chemical reactions that are causing the acid formation. The objectives of this project are to define the groundwater flow system thoroughly, to identify the types and locations of reactions that are creating acidity, and to design and evaluate prevention techniques that are specific to this setting.

A total of 25 wells are being monitored, plus one spring and one mine portal. Continuous recorders are in use, measuring rain timing and rates, groundwater level, and changes in discharge rates from the mine portal. Water-quality samples are being collected twice each year at selected sites; over 30 water quality samples have been collected. During monitoring of well installations, 300-feet of core were collected for acid-base and mineralogic evaluation. These analyses are nearing completion at Western Research Institute in Laramie, Wyoming.

Discharge rates from the mine vary seasonally, from around 10 gallons per minute to a high of 85 gallons per minute. Acidity, as measured by pH, has ranged between 2.2 and 3 units. A spring issuing from the overburden has shown discharge rates between 15 and 35 gallons per minute and pH values between 6.6 and 7.8. Acid/base accounting and aquifer monitoring indicate the formation of acidity in or very close to the mine, rather than as a gradual process along the entire flow path.

Work yet to be done includes completion of testing to identify flow paths, and quantify flux through the system. Testing will include aquifer pumping tests, slug tests, and tracer tests. Regular monitoring will continue for the duration of the project, and databases will be maintained. The last phase of the project will begin identifying and evaluating amelioration technology. A final report will then be written.

## **11. Deer Lodge Valley Conservation District/Developing Acid/Heavy Metal-Tolerant Cultivars for Mine Reclamation**

This project is under contract and is scheduled to be completed in February 1999. The goal of this project is to identify and select plant materials that are tolerant to sites characterized by either acidic conditions or high concentrations of heavy metals. This process begins with seed or plant collection; progresses through initial evaluation, seed increase, and advanced field testing; and culminates with the plant selection being released to commercial seed growers.

The following tasks have been completed:

- Review of literature
- Identification of contaminated collection sites



- Seed and plant collection for testing
- Establishment of three field-testing sites
- Initial evaluation of test sites
- Testing of asexual propagation techniques on several woody plant species
- Testing on seed dormancy and germination
- Placement of three species in initial seed increase

Tasks needing to be completed for this project include seed increase, advanced (large-scale) field testing, and release to commercial seed growers. The seed increase task consists of collecting seed from the selected plants and establishing seed production fields (1/4 to 1 acre) to increase seed supplies. The advanced field testing involves the planting of test material in contaminated areas in conjunction with commercially available seeds in order to compare performance. Also, during the comparative evaluation on contaminated sites, seed will be harvested from individual superior plants to improve acid/heavy metal tolerance of the released plant material further. The eventual plant selection release to commercial growers will be based on the severity of the original collection site, plant performance when reestablished on disturbed sites, and ease of seed or plant production. Plant propagules (plants, cuttings, seed) will be provided to commercial growers for the establishment of seed production fields, orchards, or cutting blocks.





## Projects Approved by the 1991 Legislature

### **1. Chinook Irrigation District/Milk River Water Supply Project Rehabilitation and Betterment Element (Canals and Laterals)**

This project is under contract; however, no funds have been disbursed to the project sponsor. This project involves the rehabilitation of the Chinook Irrigation District's portion of the 80-year-old Milk River Irrigation Project. Existing structures will be repaired or replaced, and new structures will be added to reduce chronic water shortages.

### **2. Judith Basin Conservation District/Community-Led Rural Development in Montana**

This project was completed in May 1996. Judith Basin Conservation District sponsored the implementation of a statewide community-led rural development effort through the organization and development of three new RC&D areas. RC&Ds work on matters of natural resource management, economic development, community development, and human development. The three RC&D areas involved are Northwest Regional, North Central Montana, and Eastern Plains.

### **3. Montana Salinity Control Association (MSCA)/Soil and Water Nonpoint Source Pollution Control and Management**

The project is scheduled to be completed in December 1996. MSCA operates a program of technical field assistance designed to correct saline seep and reclaim land on a farm-by-farm basis. Recharge area identification, hydrogeologic investigation, and soil and water quality sampling and monitoring are used to develop reclamation plans; intensive cropping methods are emphasized. MSCA is completing fieldwork and planning for 20 new projects.

### **4. Montana State University-Reclamation Research Unit/Effect of Sodium, Chlorine, and Total Salts from Treated Cyanide Solutions on Soils**

The project was completed in August 1996. MSU evaluated the impact of discharging treated or excess dilute cyanide solutions on mine land application areas in terms of sodium, chlorine, and salinity. Three mine land application areas of different soil textures were investigated between 1992 and 1994. A report on the results of this project titled, *The Effect of Land Application of Neutralized Cyanide Solution on Soil Salinity and Sodicity*, has been published by MSU.

### **5. Montana Department of Environmental Quality/Nonpoint Pollution Control Project in Montana**

This project was completed in September 1996. This project funded several of Montana's voluntary nonpoint source pollution control projects. Funds were used for watershed project implementation, water body assessment, educational materials, and technical assistance.

### **6. Montana Bureau of Mines and Geology (MBMG)/ Downhole Geophysical Logging Techniques Applied to Cased Water Well or Monitor Well Completion**

The activities outlined in the scope of work, and more, have been completed. The purpose of this project is to develop and document geophysical methods for investigating well completions in water wells and monitor wells. The investigation consisted of two major parts: laboratory tests, and field confirmations. A total of 236 laboratory tests were completed, using barrels with 2-inch and 4-inch well casings and cement, bentonite, and sand grouting materials.



Geophysical tools used in the laboratory were radial gamma-gamma density, focused gamma-gamma density, neutron, and natural gamma. A draft version of the final report has been completed, and release of the results as a MBMG open-file report is planned before December 1996.

Radial gamma-gamma is sensitive to most variations in well completions. Long-spaced focused gamma-gamma is acceptable in some settings. All tools clearly distinguish steel from PVC casing, with signal attenuations between 20 and 60 percent.

Annular materials can be distinguished, if all other variables are held constant. Differences between cement and bentonite are fairly easily recognized, whereas the density of bentonite is nearly impossible to quantify. The simplified linear relationship between counts per second (tool response) and grout density is a 6 percent slope for radial gamma-gamma.

Annular thickness is difficult to identify using the tools that were tested. Radial gamma-gamma was the best tool, with signals that identified grout thickness for some materials through 2-inch diameter casing. All tools did very poorly in 4-inch casing.

Tool responses in field tests were generally similar, although much more complicated. Steel or PVC casing were easily identified, and cement, bentonite, and sand packs were distinguished. Additional logs used in field settings were: caliper, resistivity, single-point resistivity, spontaneous potential, and sonic. Caliper showed damaged casing in several wells. Both resistivity and single-point resistivity showed screened intervals. Spontaneous potential showed no usable signals. Sonic logs proved very useful for showing damaged casing. A suite of geophysical logging tools, interpreted by a well trained and knowledgeable person, has excellent capabilities for identifying wells completions. Neither a kitchen recipe approach nor a foolproof set of tool responses is possible to develop.

## **7. Carbon, Chouteau, Custer, Dawson, and Lake Counties Pesticide Contamination Cleanup**

This project is not yet under contract, and no funds have been disbursed. The purpose of this project is to conduct the cleanup portion of the pesticide project begun by DEQ and described in this report as the first project in the following section (Projects Approved by the 1989 Legislature). The legislature appropriated \$300,000 for this project.

## **8. Butte-Silver Bow/ Upper Clark Fork River Basin Coordinator**

This project is completed. Butte-Silver Bow hired a Superfund issues and technical information coordinator to provide policy, procedural, and technical information to the local governments and citizens of Silver Bow, Deer Lodge, and Granite Counties to enable them to participate effectively in decisions concerning the assessment, management, and rehabilitation of the basin's natural resources that were impacted during past mining. A summary of reported activities is too lengthy to include in this report, but is available from DNRC.

## **9. Montana Department of Natural Resources and Conservation /Arsenic in the Upper Missouri River Basin**

The project is scheduled for completion December 1996. DNRC, in conjunction with the U.S. Geological Survey and Montana State University, is evaluating surface water and groundwater arsenic concentrations and loads in the upper Missouri River system. Data currently being gathered will be used to evaluate the effect of water management actions in the basin and help identify appropriate measures to minimize the impact of arsenic on basin water quality.



## Projects Approved by the 1989 Legislature

### **1. Montana Department of Environmental Quality/Pesticide Contamination Cleanup in Montana**

This project is complete. This project involved the investigation of pesticide-contaminated sites in, or adjacent to, three rural airports and two weed control districts. The five sites investigated were the Joliet weed control district, Miles City airport, Richey airport, Geraldine airport, and Lake County weed district. Site investigations, feasibility/treatability studies, and risk assessments have been completed for all five sites.

The results of the assessments indicated that the levels of dioxin found at the Joliet site warrant the highest priority for cleanup of the five sites. The high risks associated with the site limit the remediation choices and drive up the costs. The Joliet site will require all of the funds originally allocated for cleanup of all five sites. Since there will not be enough funds to clean up all the sites, letters have been issued by DEQ to the effect that no further action will be required for the other four sites. Cleanup at Joliet is scheduled for fall of 1996. Funds from a 1991 grant will be used for the pesticide cleanup.

### **2. Montana Bureau of Mines and Geology/ Use of Natural Zeolites in Reducing Metal Concentrations at Mining Operations and Impacted Lands**

The project will be completed in November 1996. The purpose of this project is to investigate the use of naturally occurring zeolites in tailings impoundments, disposal sites, and reclamation practices at sites contaminated with heavy metals. The research for this project has been completed. The final report is due to be completed in November 1996.

### **3. Montana Department of Natural Resources and Conservation-Conservation Districts Bureau/ Nonpoint Source Pollution Control in Montana**

This project was completed in June 1996. The purpose of this project was to provide cost-share funds to landowners for the installation of best management practices to improve water quality. Demonstration projects were completed on three priority streams: Butcher Creek in Stillwater County, Godfrey Creek in Gallatin County, and Big Otter Creek in Judith Basin County. Funds were also used for educational workshops for landowners.



## Projects Approved by the 1987 Legislature

### **1. Montana Department of Fish, Wildlife and Parks (DFWP)/ High Ore Creek Reclamation Project**

Construction of this project was completed in fall of 1994. DFWP and the construction contractor are negotiating final payment.





**TABLE 2**  
**FUNDING INFORMATION FOR PROJECTS COMPLETED**  
**DURING THE 1997 BIENNIUM AND ACTIVE PROJECTS**

| PROJECT SPONSOR--Project Title                             | APPROPRIATED<br>AMOUNT | CONTRACTED<br>AMOUNT | AMOUNT<br>DISBURSED<br>(AS OF 10/07/96) |
|--|------------------------|----------------------|---|
| <u>1995 Legislature</u>                                    |                        |                      |   |
| DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION           | \$300,000              | \$300,000            | \$300,000                               |
| --Abandoned Mine Reclamation Project                       |                        |                      |   |
| BOARD OF OIL AND GAS CONSERVATION                          | 300,000                | 300,000              |   |
| --Devil's Basin: Plug, Abandonment, and Restoration        |                        |                      |   |
| BOARD OF OIL AND GAS CONSERVATION                          | 300,000                | 300,000              |   |
| --South Cut Bank Field-A: Plug, Abandonment, & Restoration |                        |                      |   |
| BOARD OF OIL AND GAS CONSERVATION                          | 300,000                | 300,000              | 1,410                                   |
| --South Cut Bank Field-B: Plug, Abandonment, & Restoration |                        |                      |   |
| DEPARTMENT OF STATE LANDS                                  | 183,260                | 183,260              |   |
| --Oil Well Abandonment                                     |                        |                      |   |
| LEWIS & CLARK COUNTY/CITY OF HELENA                        | 75,000                 | 75,000               |   |
| --Tenmile Mine Site Reclamation Project                    |                        |                      |   |
| MONTANA STATE UNIVERSITY                                   | 100,000                | 100,000              | 681                                     |
| --Clean Tailings Reclamation                               |                        |                      |   |
| CASCADE COUNTY CONSERVATION DISTRICT                       | 300,000                | 300,000              | 170,171                                 |
| --Muddy Creek Water Quality Improvement                    |                        |                      |   |
| DEPARTMENT OF ENVIRONMENTAL QUALITY                        | 300,000                |                      |   |
| --Nonpoint Pollution Control                               |                        |                      |   |
| BUTTE-SILVER BOW LOCAL GOVERNMENT                          | 93,622                 | 93,622               | 25,684                                  |
| --Upper Clark Fork Basin: Superfund Technical Assistance   |                        |                      |   |



| PROJECT SPONSOR--Project Title                                  | APPROPRIATED<br>AMOUNT | CONTRACTED<br>AMOUNT | DISBURSED<br>(AS OF 10/07/96) |
|---|------------------------|----------------------|-------------------------------|
| MONTANA STATE UNIVERSITY EXTENSION SERVICE                      | 59,625                 | 59,625               |                               |
| --Pollution Prevention Program                                  |                        |                      |                               |
| GLACIER COUNTY CONSERVATION DISTRICT                            | 150,000                |                      |                               |
| --Water Quality Demonstration & Reclamation, Red River Drainage |                        |                      |                               |
| TOOLE COUNTY  | 295,246                | 295,246              |                               |
| --North Toole County Reclamation Project                        |                        |                      |                               |
| DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION                | 11,000                 | 11,000               |                               |
| --Scobey Reclamation Site                                       |                        |                      |                               |
| PETROLEUM COUNTY CONSERVATION DISTRICT                          | 300,000                | 232,247              |                               |
| --Petroleum County Artesian Basin Groundwater Project           |                        |                      |                               |
| TOTAL   | 3,067,753              | 2,550,000            | 497,946                       |
| 1993 Legislature  |                        |                      |                               |
| BOARD OF OIL AND GAS CONSERVATION                               | \$299,000              | \$299,000            | \$299,000                     |
| --Kevin-Sunburst Plugging and Reclamation Project               |                        |                      |                               |
| BOARD OF OIL AND GAS CONSERVATION                               | 214,810                | 214,810              | 45,389                        |
| --Cat Creek Plugging and Reclamation Project                    |                        |                      |                               |
| GOVERNOR/LT. GOVERNOR'S OFFICE                                  | 127,667                | 127,667              | 127,667                       |
| --The Montana Office of Public Policy Dispute Resolution        |                        |                      |                               |
| BROADWATER CONSERVATION DISTRICT                                | 296,300                | 296,300              | 289,759                       |
| --Whites Gulch Placer Mine Reclamation Project                  |                        |                      |                               |
| TOOLE COUNTY  | 273,284                | 273,284              | 215,745                       |
| --North Toole County Oil Field Reclamation Project              |                        |                      |                               |
| DEPARTMENT OF FISH, WILDLIFE AND PARKS                          | 72,850                 | 72,850               | 65,958                        |
| --Elk Creek Placer-Mined Channel Reconstruction                 |                        |                      |                               |



| PROJECT SPONSOR--Project Title  | APPROPRIATED<br>AMOUNT | CONTRACTED<br>AMOUNT | DISBURSED<br>(AS OF 10/07/96) |
|---|------------------------|----------------------|-------------------------------|
| COLUMBUS AND JOLIET, TOWNS OF   | 41,172                 | 41,172               | 22,783                        |
| --Waste Stream Reduction--Oil Recycling                               |                        |                      |                               |
| CARBON CONSERVATION DISTRICT  | 300,000                | 300,000              | 181,571                       |
| --RC&Ds Affecting Change through Local Leadership                     |                        |                      |                               |
| DEPARTMENT OF ENVIRONMENTAL QUALITY                                   | 300,000                | 300,000              | 98,098                        |
| --Nonpoint Source Pollution Control in Montana                        |                        |                      |                               |
| MONTANA BUREAU OF MINES AND GEOLOGY                                   | 148,623                | 148,623              | 72,911                        |
| --Acid Mine Drainage Prevention, Control, & Treatment Technology      |                        |                      |                               |
| DEER LODGE VALLEY CONSERVATION DISTRICT                               | 120,000                | 120,000              | 91,825                        |
| --Developing Acid/Heavy Metal-Tolerant Cultivars for Mine Reclamation |                        |                      |                               |
| TOTAL   | 2,193,706              | 2,193,706            | 1,510,706                     |
| 1991 Legislature  |                        |                      |                               |
| CHINOOK IRRIGATION DISTRICT   | \$300,000              | \$300,000            |                               |
| --Milk River Water Supply, Rehabilitation, and Betterment             |                        |                      |                               |
| JUDITH BASIN CONSERVATION DISTRICT                                    | 170,000                | 170,000              | 157,037                       |
| --Community-Led Rural Development in Montana                          |                        |                      |                               |
| MONTANA SALINITY CONTROL ASSOCIATION                                  | 137,500                | 137,500              | 100,064                       |
| --Soil and Water Nonpoint Source Pollution Control                    |                        |                      |                               |
| MONTANA STATE UNIVERSITY  | 82,885                 | 82,885               | 82,885                        |
| --Effect of Sodium, Chlorine, and Total Salts on Soils                |                        |                      |                               |
| DEPARTMENT OF ENVIRONMENTAL QUALITY                                   | 146,620                | 146,620              | 135,761                       |
| --Nonpoint Pollution Control Project in Montana                       |                        |                      |                               |
| MONTANA BUREAU OF MINES AND GEOLOGY                                   | 39,749                 | 39,749               | 36,617                        |
| --Downhole Geophysical Logging Techniques                             |                        |                      |                               |





| PROJECT SPONSOR--Project Title  | APPROPRIATED<br>AMOUNT | CONTRACTED<br>AMOUNT | DISBURSED<br>(AS OF 10/07/96) |
|---|------------------------|----------------------|-------------------------------|
| CARBON, CHOUTEAU, CUSTER, DAWSON, AND LAKE COUNTIES<br>--Pesticide Cleanup                              | 300,000                |                      |                               |
| BUTTE-SILVER BOW LOCAL GOVERNMENT<br>--Upper Clark Fork River Basin Coordinator                         | 60,000                 | 60,000               | 59,792                        |
| DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION<br>--Arsenic in Upper Missouri River Basin             | 179,330                | 179,330              | 157,273                       |
| TOTAL   | 1,416,084              | 1,116,084            | 729,429                       |
| <u>1989 Legislature</u>   |                        |                      |                               |
| DEPARTMENT OF ENVIRONMENTAL QUALITY<br>--Pesticide Contamination Cleanup in Montana                     | \$150,000              | \$150,000            | \$137,920                     |
| MONTANA BUREAU OF MINES AND GEOLOGY<br>--Use of Natural Zeolites in Reducing Heavy Metal Concentrations | 149,238                | 149,238              | 127,945                       |
| DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION<br>--Nonpoint Source Pollution Control in Montana      | 262,573                | 262,573              | 232,769                       |
| TOTAL   | 561,811                | 561,811              | 498,634                       |
| <u>1987 Legislature</u>   |                        |                      |                               |
| DEPARTMENT OF FISH, WILDLIFE AND PARKS<br>--High Ore Creek Reclamation Project                          | \$198,600              | \$188,436            | \$148,754                     |
| TOTAL   | 198,600                | 188,436              | 148,754                       |





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Montana Department of Natural Resources and Conservation



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